Heating Piping & Air Conditioning

JANUARY
1960

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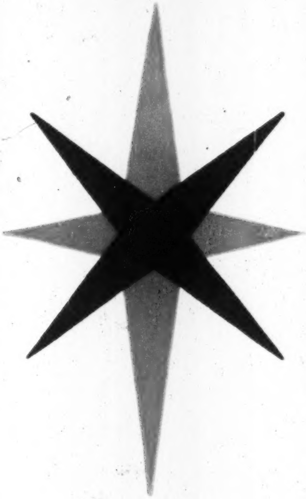

directory and show number

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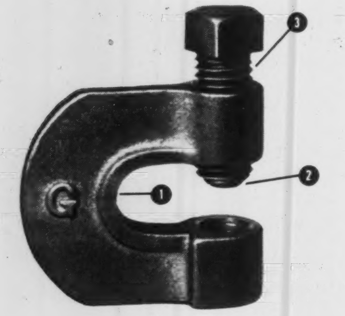
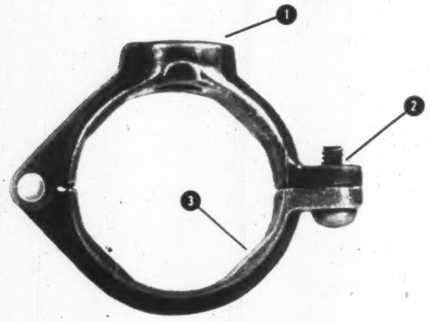
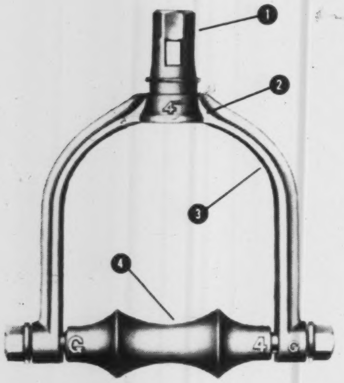
Look at all the extras you get in Grinnell Pipe Hangers . . . yet you pay no more!



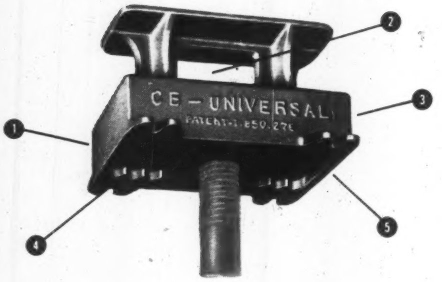
GRINNELL C-CLAMP, FIG. 88 — 1 Ribbed, malleable iron casting, for extra strength **2** Hardened steel, cup-point set screw for good "grip" on beam **3** Full thread engagement – casting is drilled and tapped for rod and set screw



GRINNELL EXTENSION SPLIT RING, FIG. 138 — 1 Nipple engaging thick section of malleable iron gives rigidity for support from above, below or from wall **2** Tapped to take screw. No nut to lose **3** Special ring contour holds pipe or tubing firmly



GRINNELL ADJUSTABLE SWIVEL PIPE ROLL, FIG. 174 — 1 Swivel shank permits adjustment without elaborate support **2** Locking device prevents accidental adjustment change; no lock nut required **3** Ribbed design in malleable iron for better strength, lightness, appearance **4** Easy installation; maximum adjustment



GRINNELL CB CONCRETE INSERT, FIG. 282 — 1 One body size accommodates several sizes of rods **2** Slot takes reinforcing rods to assure maximum load rating **3** One-piece body prevents concrete seepage **4** Teeth on insert and nut hold rod firmly in place **5** Homogeneous composition of malleable iron throughout

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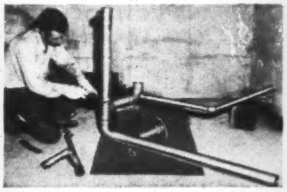

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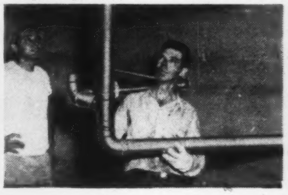
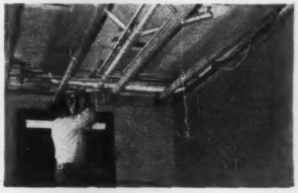


Compact Connections—Save Space



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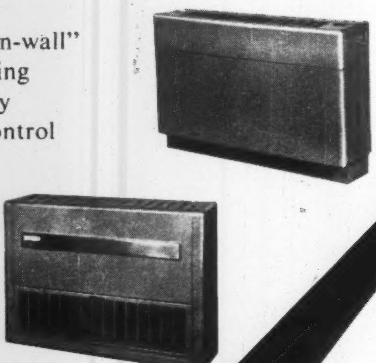

The Webster Newport year-round air conditioners are compact cabinet-type "in-wall" units. Require no central system for cooling—feature self-contained cooling chassis by Chrysler Airtemp. Permit easy, instant control of heating or cooling from individual unit . . . room-by-room, zone-by-zone. Designed to connect readily to existing or new steam or forced hot water heating system. New all-electric model ties in with electrical circuiting.

Webster also makes the Riviera lines of heating-cooling conditioners, using the same piping for heating with warm water, cooling with chilled water.

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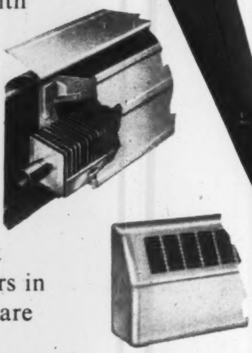

Webster "Tru-Perimeter" Walvector and Baseboard installations provide healthful wall-to-wall steam or hot water heating for every application. Attractive wall-mounted steel enclosures blend harmoniously with any type of decor. Room air passes over highly efficient finned-tube heating element. Air currents are gentle, draft free—to blanket interior walls with warm air. Simplicity of piping and assembly minimizes installation costs.

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CLARAGE

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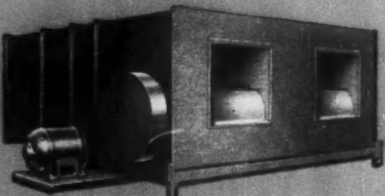
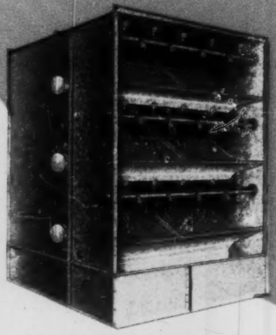
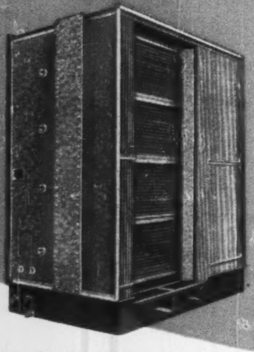


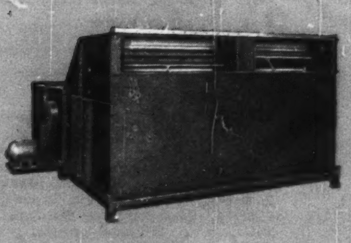
Draw-Thru Multitherms* for comfort and process air conditioning applications. Sprayed coil units also available. **Catalog 1307. Hi-Static Multitherms** for pressures to 8" SP. **Bulletin 1312. Capillary Conditioners** for exceptional air cleaning. **Catalog 1351.**



Air Washers Capillary (shown) and Spray Type Air Washers for air cleaning and purification. **Catalog 405** for Capillary type; **Catalog 400** for Spray type.

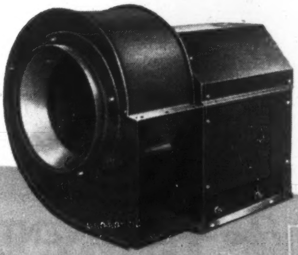


Unicoil* Units Sprayed coil equipment designed principally for cooling and dehumidifying service in central station air conditioning systems. Cutaway view above. **Catalog 411.**

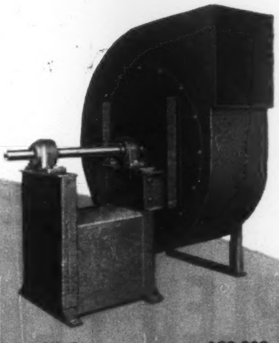


Blow-Thru Multitherms* for zone control air conditioning. A single unit handles different needs simultaneously in different areas by a separate set of mixing dampers for each zone. **Bulletin 1310.**

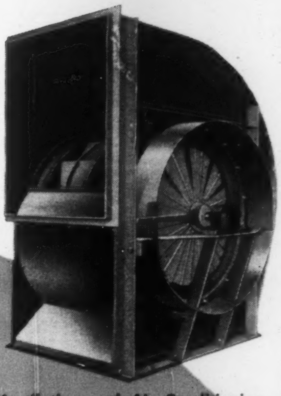
Clarage Fan Company



Ready Unit* Ventilating Sets Complete ready-to-run units for smaller air handling requirements. Direct connected (Bulletin 500) and V-belt models (Catalog 517) in 25 sizes, capacities 100 to 22,000 cfm.



Type XL Fans range up to 130,000 cfm, 18" SP, 60" inlet diameter for industrial air and material handling assignments. Four wheel types, 16 fan sizes — smaller sizes adjustable as to discharge. **Bulletin 702.**

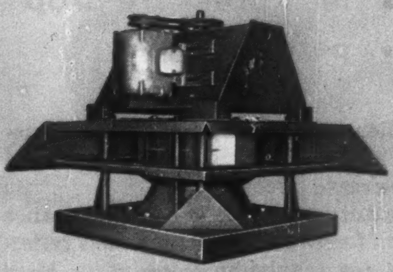


Ventilating and Air Conditioning Fans Type NH (shown) with backwardly inclined blade wheels, capacities 1,000 to 725,000 cfm. **Catalog 221. Type HV Fans** with forward curved multiblade wheels, capacities 150 to 450,000 cfm. **Bulletin 200.**

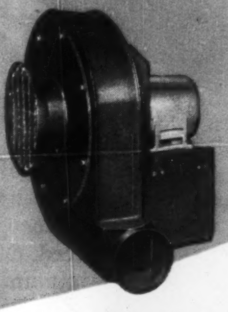
The Clarage line also includes Unitherm* Unit Heaters with multiblade fans, Catalog 1115 . . . Clarco* Unit Heaters with propeller fans, Catalog 1101 . . . Unit Stoker Fans, Bulletin 31 . . . Propeller Fans with capacities 700 to 36,000 cfm, Bulletin 520 . . . Vortex Control* for air volume regulation, Catalog 122 . . . Mechanical Draft Fans, Catalogs 905, 901, 802. By specializing — building air handling and conditioning equipment exclusively — Clarage has a concentrated "know-how" that means important dividends to you.

ALSO

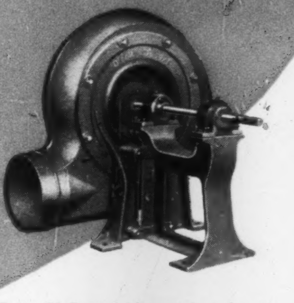
Type AF Dynafoil Fans with airfoil blade design for conduit type air conditioning, industrial processes, tunnel ventilation, mechanical draft, and similar applications. Heavy-duty. **Catalog 859.**



Centrilators*‡ Centrifugal type power roof ventilators with an exclusive Clarage Jet Siphon*‡ feature for quiet performance, high efficiency. 10 sizes, capacities to 26,400 cfm. Shown uncovered. **Bulletin 550.** Direct drive units, **Bulletin 570.** Propeller type units, **Bulletin 590.**



Type O Fans for industrial applications ranging to 50" SP and to 13,000 cfm. Wide selection of sizes and wheel diameters permits precise selection of the proper unit. **Catalog 855.**



Type CI Fans with cast iron housings, primarily for smaller volume exhaust applications. Capacities 200 to 3,800 cfm, pressures to 24" SP. Adjustable as to discharge. Two wheel types. **Catalog 705.**

*Trademark
‡Patent applied for

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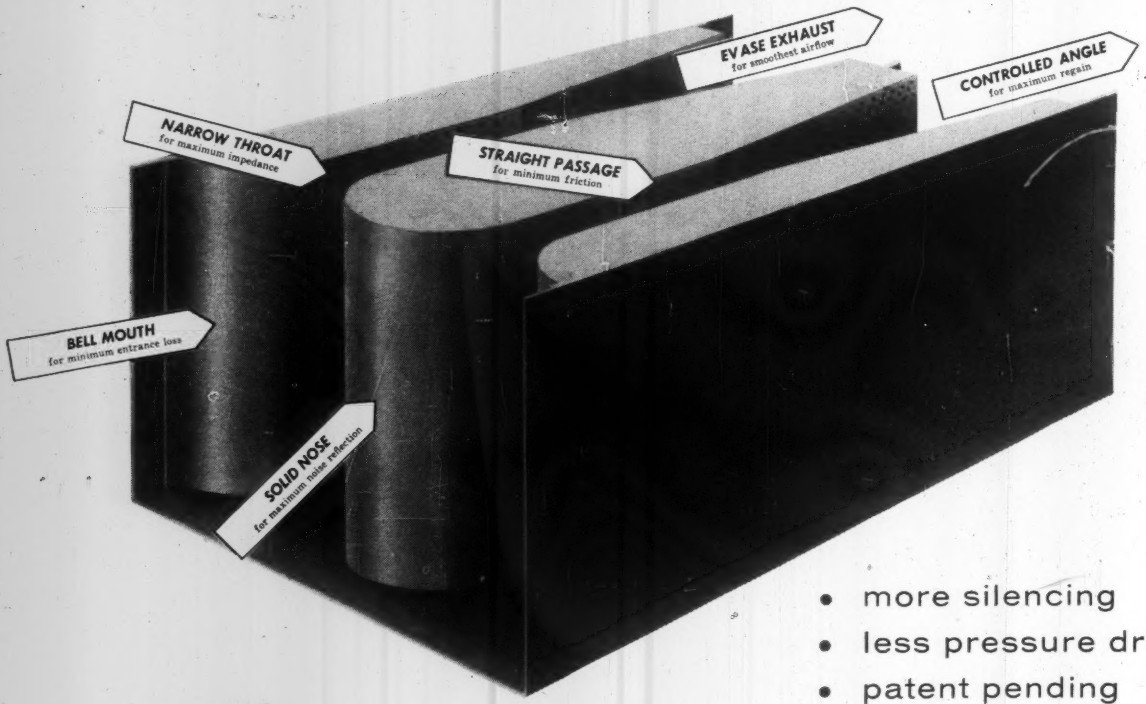
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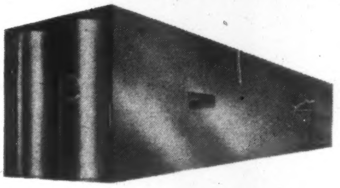

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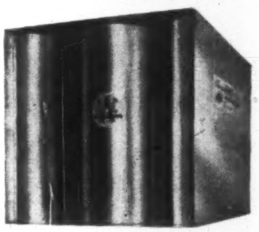

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2

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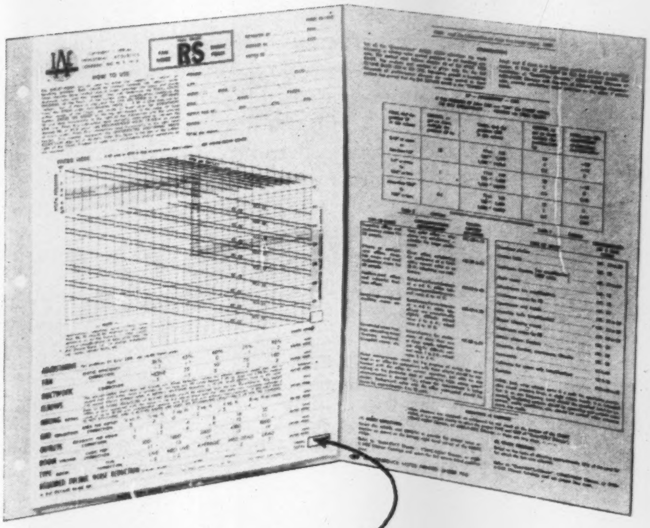

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THERMOSTATS
and VALVE SEATS

*Guardian of
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and Comfort*

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A complete line of Low, Medium and High-Pressure Thermostatic Traps for service with radiation, dryers, sterilizers, mangles, cookers and similar uses. *Renewable thermostats and seats are important constructional features contributing to long life and low cost service.* Medium and High Pressure Traps have stainless steel pins and renewable seats.

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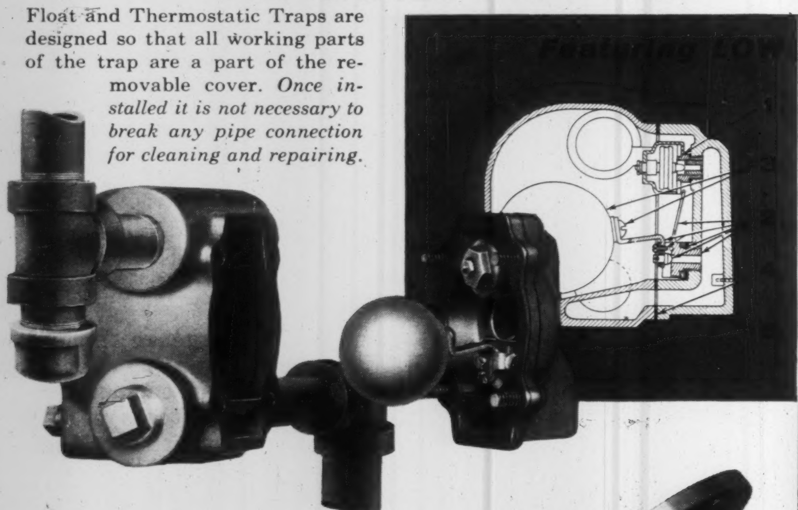
Float and Thermostatic Traps are designed so that all working parts of the trap are a part of the removable cover. *Once installed it is not necessary to break any pipe connection for cleaning and repairing.*



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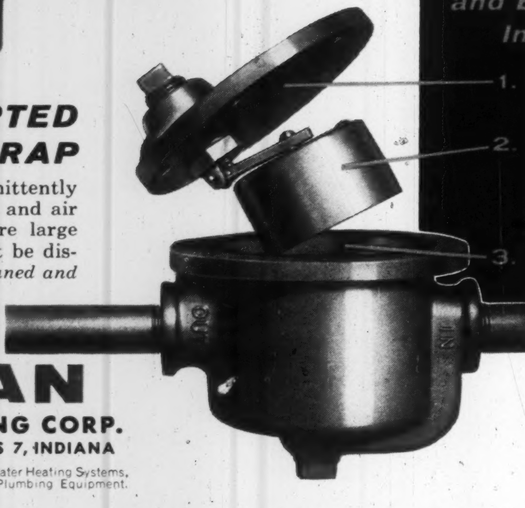

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LETTER FROM THE EDITOR

January 1960

Dear Reader:

I hope you will find this January issue to be another helpful and useful one throughout the year. The Directory section has been revised and brought up-to-date, and it will be found in the yellow pages.

Many special features are included in the pages from 157 through 240, and the significant points about each will be mentioned here, so you may quickly see the ones that will interest you first.

The need for estimating the energy requirements for operating the mechanical refrigeration equipment in large central air conditioning systems during the planning and design is essential for any economic analysis to be complete. A guide for estimating these needs is presented on pages 157 to 164. In analyzing the costs for these systems, generally, there is not enough consideration given to overall operating economics. The equipment, therefore, should be regarded as a long term investment. In addition to fuel and energy costs, adequate evaluation should be given to costs for maintenance, condensing water, and fixed charges for the investment. To prove the accuracy of this estimating method, metered results in four types of buildings during one air conditioning season was obtained and is also included.

How corrosion of copper and copper alloys are affected by velocity and temperature of potable water in heat exchangers and piping systems is discussed by Dr. Obrecht and Dr. Quill of Michigan State University on pages 165 to 169. This is the first article in a series in which the results of an extensive research program was conducted through the joint cooperation of MSU and the Copper & Brass Research Association. This first article explains the situation that developed the need for these studies and some of the results obtained in 45 main test panels operating from 324 to 632 days. These were installed in MSU buildings with several corrective measures imposed such as limitation of water temperature to 140 F, blending of treated and untreated water, neutralizing of the carbon dioxide content of the water, and others. These observations showed that corrosion and erosion appeared to be the net result of temperature, velocity, and water composition.

The changes made in the Chevrolet engine plant supply air system to improve the industrial environment are explained by K. E. Robinson in his article on pages 170 to 173. Even though this large plant was built in 1954, certain shortcomings were found in the first winter's operation and during the first summer which management felt should be corrected. The procedures followed in analyzing the problem and in determining the changes that should be made as reported in this article, should be a good example to follow.

The subject of steam and what every heating engineer should know about this important heating medium is covered by Willie Hammer in his 77 questions and answers on pages 174 to 181.

A new and highly accurate method for selecting dehumidifying cooling coils for chilled water and direct expansion systems is presented on pages 185 to 193. This method is the result of several years of research and testing and incorporates both new and existing theories into a valuable working tool. T. W. Ernst is the author, and he says considerable savings in design time can be achieved with this new method.

The solution of piping stress problems in the design of these systems seems to be leaning more and more toward the use of electronic

(*Continued on page* 14)

High-Velocity

for the new Equitable Life Assurance Society Building . . . World's Largest Single Occupancy Tower

In matters that concern health, few institutions are more aware of the problems than the Equitable Life Assurance Society of the United States. In their new office building in New York—the world's largest single-occupancy office building—approximately 1,250,000 cubic feet of air per minute will be kept super clean by Cambridge AEROSOLVE 95 filters.

With a discoloration efficiency of 95% on atmospheric dust, the AEROSOLVE 95 removes not only visible dust, but also the invisible smudge-producing particles, such as the aerosols in smoke, which cause high cleaning and maintenance costs and which may constitute a health hazard.

INSTALLATION DETAILS

Approximately 1,250,000 C.F.M. in 32 separate systems

Filters, Model 43D-95 Cambridge AEROSOLVE
  1800 C.F.M.
  450 F.P.M. face velocity, resulting in minimum space requirements
  Dimensions 24" x 24" x 24"
  Permanent cadmium-plated frames
  Underwriters Laboratory Class 1 rating

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Cambridge Filter ®

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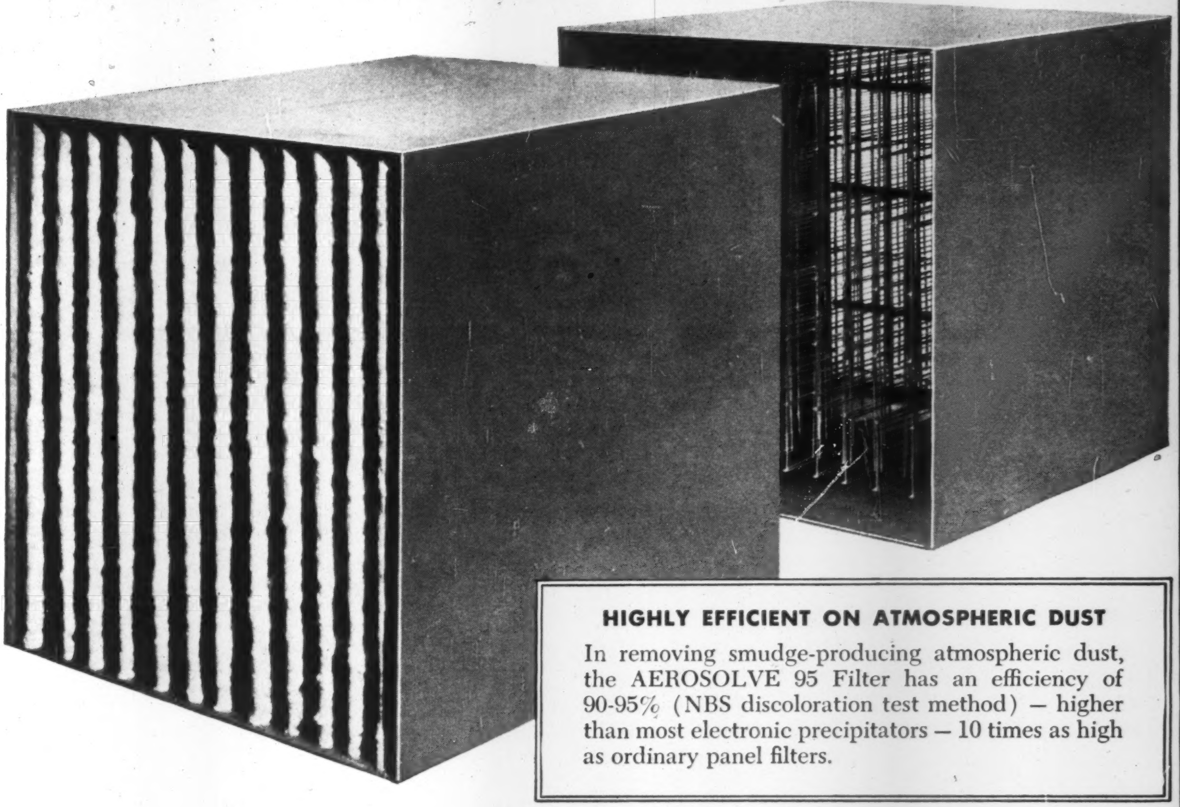

HIGHLY EFFICIENT ON ATMOSPHERIC DUST

In removing smudge-producing atmospheric dust, the AEROSOLVE 95 Filter has an efficiency of 90-95% (NBS discoloration test method) — higher than most electronic precipitators — 10 times as high as ordinary panel filters.

Easy Cartridge Replacement . . . No Other Maintenance Required

Except for infrequent cartridge replacement, Cambridge AEROSOLVE Filters require no maintenance. No electric, water or drain connections are needed. The permanent cadmium-plated steel frames are easily installed, and the cartridges are secured by quick-acting fasteners which make them exceptionally easy to remove and replace.

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Cambridge High-Velocity AEROSOLVE Filters have been specially designed to match today's coil velocities. They save valuable space — obviate the need for expensive duct transitions.

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Cambridge AEROSOLVE Filters provide POSITIVE air cleaning. They do not depend upon electric current — there is no chance of break-through. There is never a fall-off in cleaning efficiency; in fact, efficiency increases as the dirt load in the filter increases. Safe, reliable.

Investigate this new method of low-cost, high-efficiency air cleaning

Write for Bulletin 130

Corporation

732 E. Erie Blvd., Syracuse 1, N.Y.

(*Continued from page 11*)

computers to save many hours of calculation time. Theodore E. Bridge explains in his article on pages 196 to 198 some new equations that have been used with a high degree of accuracy with these electronic computers. Mr. Bridge explains that these new equations are especially helpful because certain difficulties have been experienced in translating the standard equations into machine language. These new equations have checked out perfectly against the results obtained manually.

Roof spraying systems have been used with good success in the ITT laboratories, according to W. O. Kind in his article on pages 200 to 203. He points out that occupants in flat-roofed, one-story buildings can be given economical, perceptible-heat relief through roof spraying systems if certain design, installation, and operating procedures are followed. These are cited along with the results he has observed in the several years that he has been responsible for their operation.

Often the price paid for speed in the design of refrigerant piping systems is costly. Herman Vetter explains on pages 204 to 210 four main factors that should be considered in order to arrive at the pipe size and fluid velocity that will give the most efficient and most economical operation. These are as follows: (1) Designing suction piping for laminar flow only when the pressure differential between the evaporator and condenser is very close, (2) Designing for transition flow if economy in plant operation is critical, (3) Keeping pressure drop to a minimum, and (4) Avoiding operation with a large pressure drop to prevent high superheat in the suction line.

The Show Section is on pages 215 to 220 which contains a preview of the 2nd Southwest Heating & Air Conditioning Exposition to be held in Dallas on February 1 through 4. The listing of the exhibitors and where you will find the products being exhibited should help in saving your time in Dallas. If you don't go to the show, the listings in our Show Section can serve as a "tour in print."

High temperature hot water heating is the subject of the HPAC Engineering Data File this month (pages 221-240). These systems are finding wider application as experience is gained with many types of installations. As in all engineering solutions, a number of different approaches can be taken to arrive at successful HTHW system design. The experience of a number of engineers who have been designing these systems was called upon to obtain up-to-date thinking on the various aspects of this system design for this report. Included in this are such phases of the subject as selection of boilers, methods of pressurization to prevent flashing of the HTHW to steam, selection of pumps, and piping design considerations. This will be a section you will want to keep for reference, I am sure.

Many interesting comments are presented in the "Open for Discussion" pages (147-150) and Question of the Month (pages 152 and 154) is on the subject of selecting steam valves. The Law and Your Profits is on page 182. The Data Sheet is on pages 183 and 184.

You will find in this issue a card which will make it convenient for you to obtain additional information about the products advertised in this issue. We have included one card opposite page 406 and a second one opposite the back cover. Because of the reference nature of this issue, there are many products advertised about which you probably would like to have more information. To do this, just circle the number on the card which represents the page number on which the advertisement appears or refer to the index of advertisers on pages 177d and 178d. Also, these numbers may be obtained from Part 1 of the Directory section on pages 3d to 10d where the products advertised in this issue are classified along with the names of the manufacturers and the pages on which the products being advertised appears.

Bob Roose

Editor, HEATING, PIPING & AIR CONDITIONING

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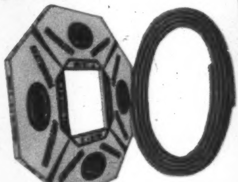

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Crimped ends seal out moisture & dirt

50 ft. coil in protective carton.

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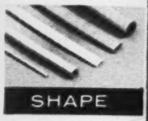
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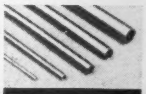
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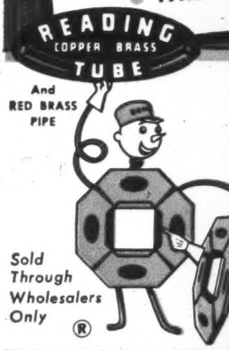

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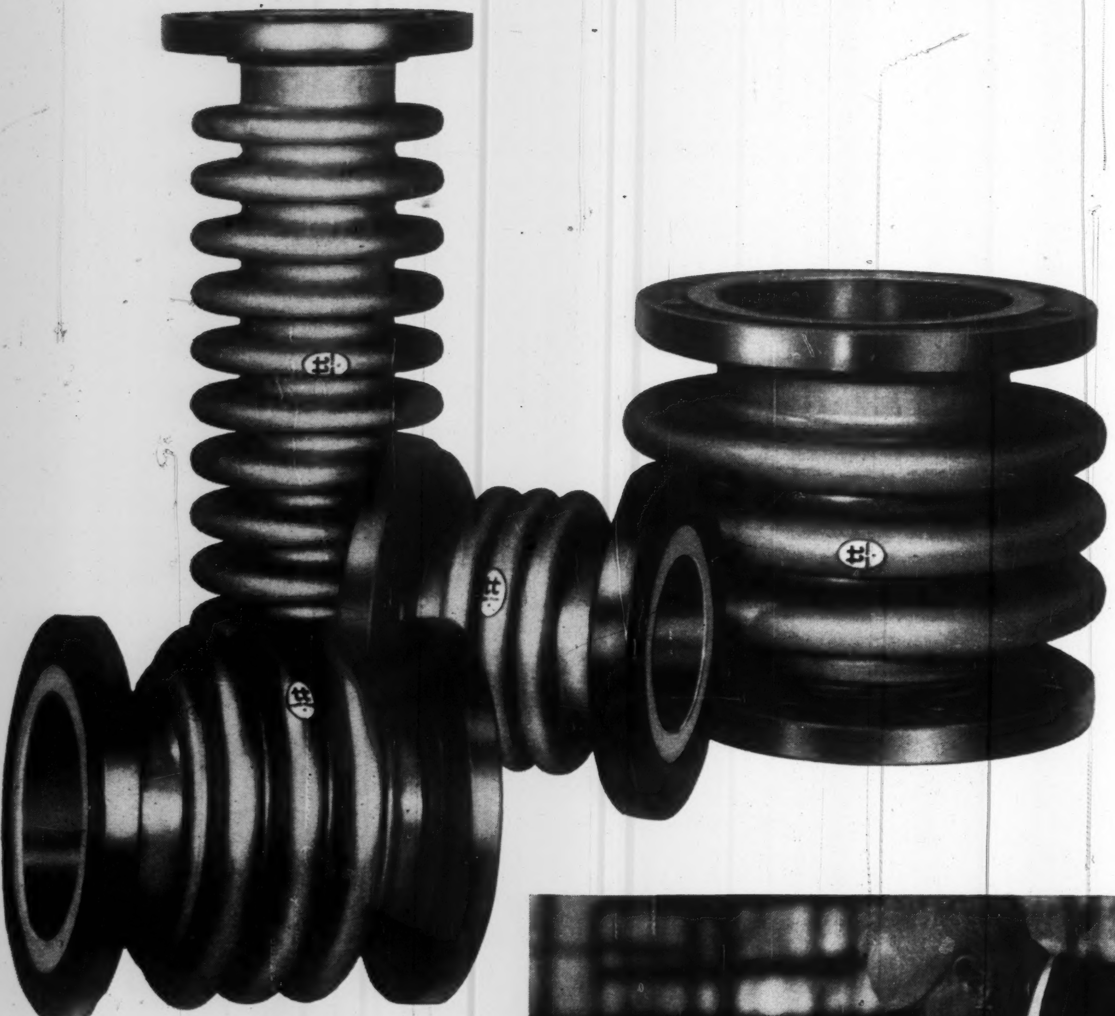

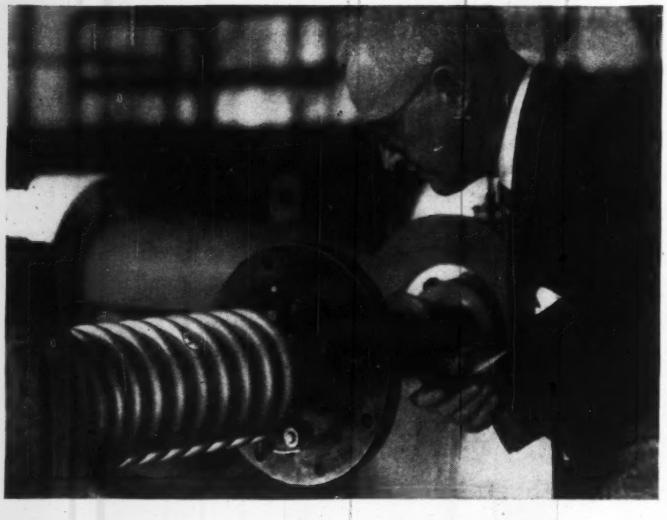

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Hence, you can specify TUBE-TURN* Bellows Expansion Joints and be sure of predictable performance. These top-quality products will be subject to the same warranties that apply to all other products of Tube Turns.

Backed by Tube Turns' technical service! This new line of products is backed by 31 years of pioneering research in piping technology, including problems of piping flexibility. Our sales-engineering staff, located nearby, will assist in the application of TUBE-TURN Bellows Expansion Joints to your specific problems.

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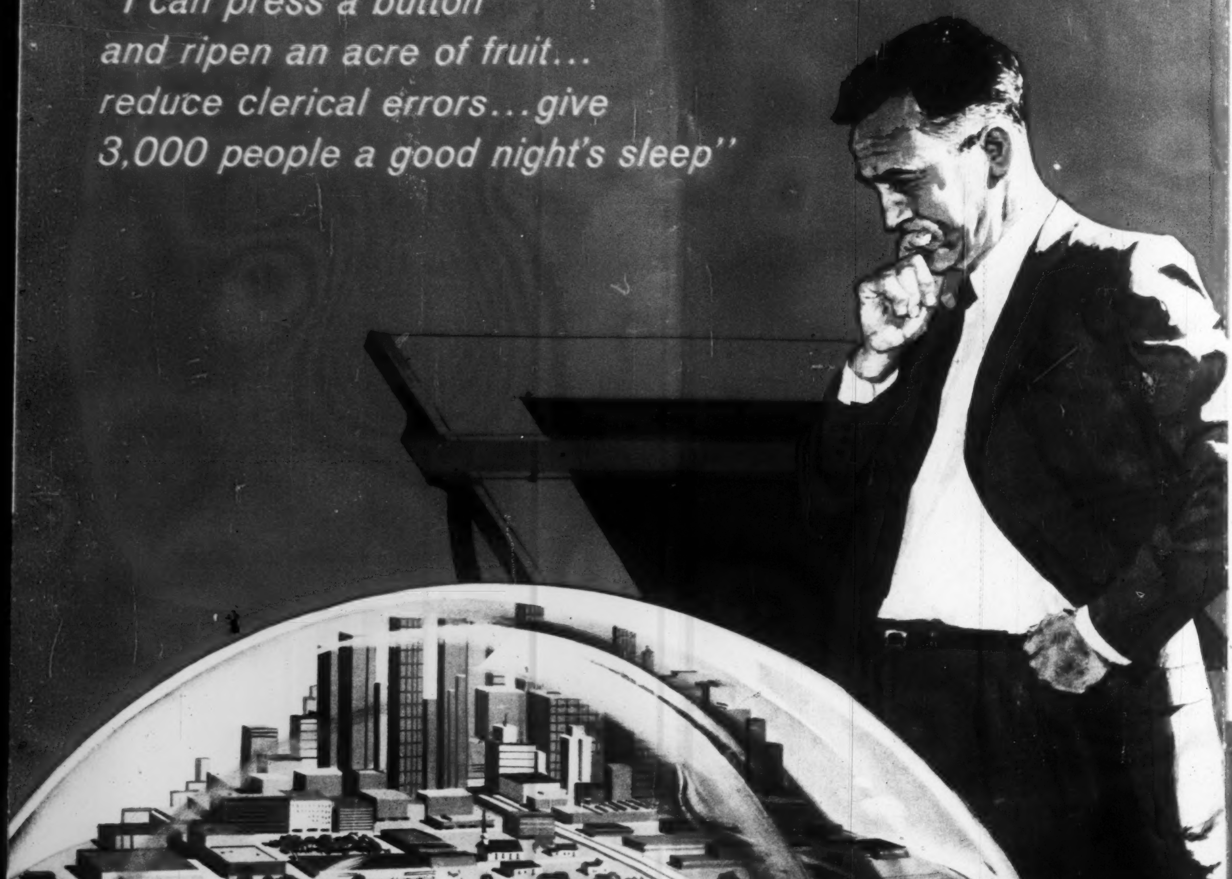

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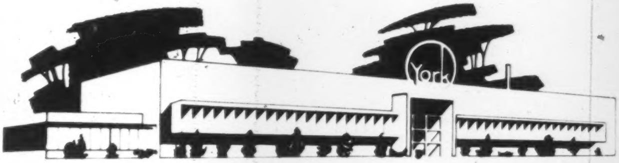

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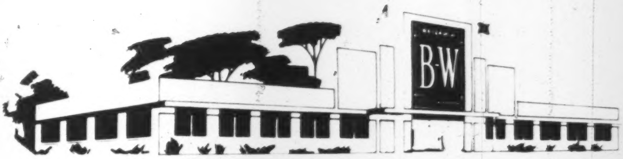

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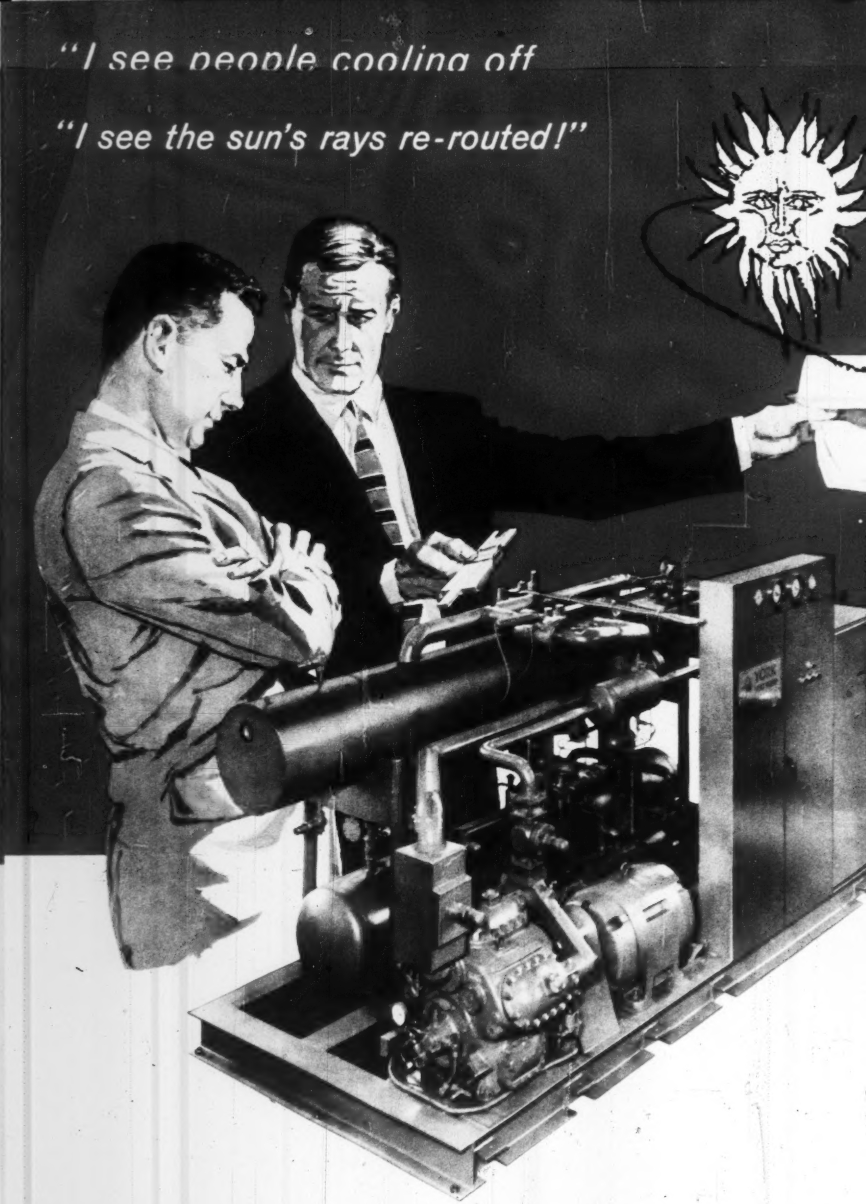
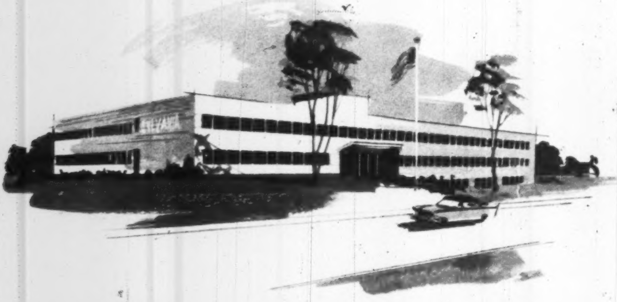
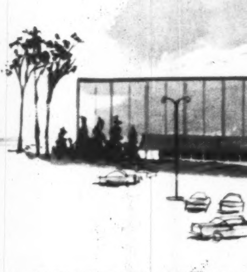

"I see people cooling off
"I see the sun's rays re-routed!"
YORK

YORK Air Source Heat Pumps in Action a



SYLVANIA LABORATORY, AMHERST, N.Y., uses a York Heat Pump to heat and cool the 85,000 sq. ft., 2½ story building. System delivers 250 tons of cooling in summer and 2400 MBH heating in winter to York perimeter fan-coil units.



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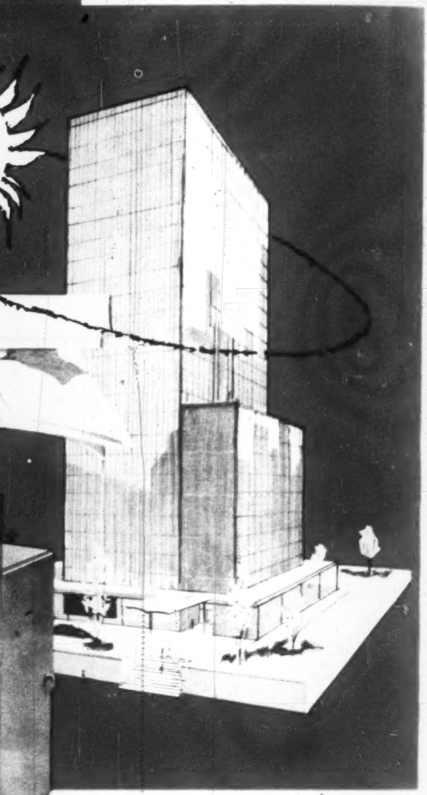
820 tons and the heating



Factory assembled models from 50 to 150 tons cooling, up to 1200 MBH heating at 0°F. Larger, field assembled systems to meet your requirements.

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pping Center, is heated and cooled by
source heat pump. Cooling capacity is
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YORK

Compound Air Source Heat Pump can heat and cool simultaneously!

Cools one side of building... uses rejected heat to warm the other side!

Because of wide variations in solar and internal heat loads, multi-story buildings require heating *and* cooling at the same time almost all year around. York's air source heat pump which can heat and cool simultaneously is the ideal answer for such a situation.

The York Heat Pump can take heat from the sunny side of the building where cooling is needed, and move this heat to the shady side where warmth is needed. Or this advanced York system can take heat from any area to be cooled, such as a data processing machine room or telephone exchange, and move it to any area needing warmth.

In this way, the York Heat Pump delivers 66⅔% of the heat absolutely free. For every kilowatt of electric power that's put into the system, *three* kilowatts worth of heat come out. The free heat comes from such sources as outside air, rejected heat from cooling, waste heat from processing, etc.

The York Heat Pump with exclusive compound compression can wring heat from −10°F. air, making it applicable for year around heating and cooling in any part of the U.S. No supplemental electric strip heating is required. The compound design produces up to 67% more heat than a single stage system from the same electric power. York Heat Pumps can be completely factory assembled and tested for simple, low cost installation, and absolutely dependable operation.

YORK

3-Pipe Hi-I Induction System makes both heating and cooling continuously available at each unit!

Gives instant response and slashes operating costs!

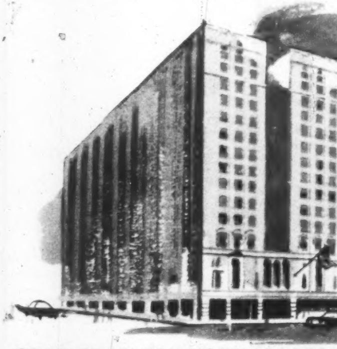
Multi-room buildings often require heating for some spaces and cooling for others simultaneously. Up to now this has been done in one of two ways: 1) Double duct systems with a warm and cold air stream that is blended at the air outlet to provide desired room temperature, or 2) Conventional induction systems that deliver warm ventilating air while circulating a variable quantity of cold water. Either method achieves control in the conditioned space by consuming both heating and cooling energy simultaneously.

York's 3-pipe system provides either heating or cooling at any time without wasteful mixing. Both hot and cold water are piped to each unit. A York-conceived automatic 3-way non-mixing control valve selects one or the other and modulates flow to provide desired temperature. If neither heating or cooling is needed, water shuts off.

Some like it hot, some like it cold. Having heating and cooling capacity always available at each unit permits wider temperature variation from room to room, and gives instant response to changes in load or thermostat setting. Assures highest level of personalized comfort ever offered!

Simplicity of York system means substantial savings in operating costs, low initial cost and reduced space needs. Added cost of the third pipe is offset by eliminating change-over problems, reheat coils, duplicate zoning equipment, simplifying air distribution and control systems.

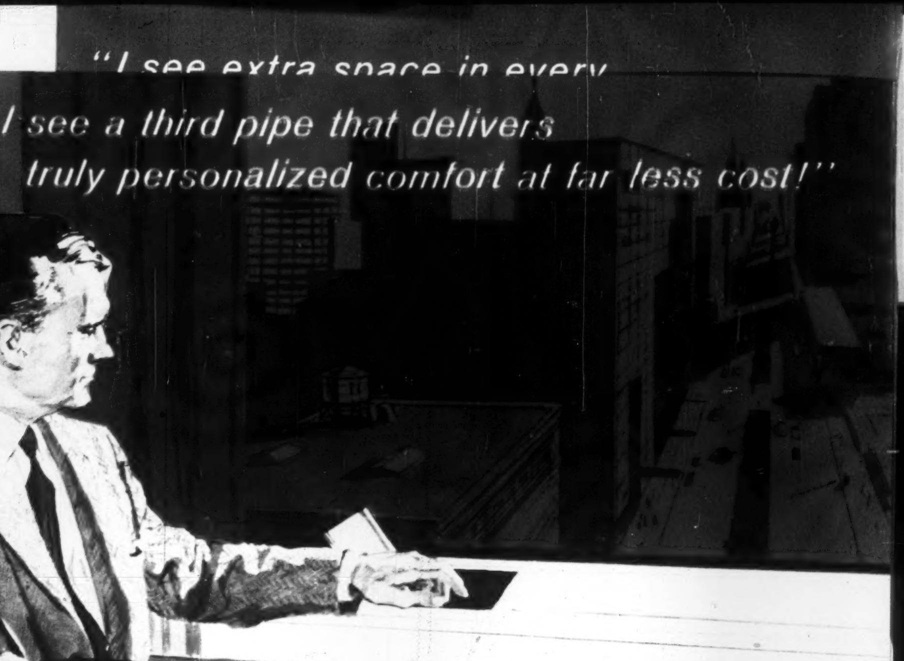
YORK 3-Pipe Hi-

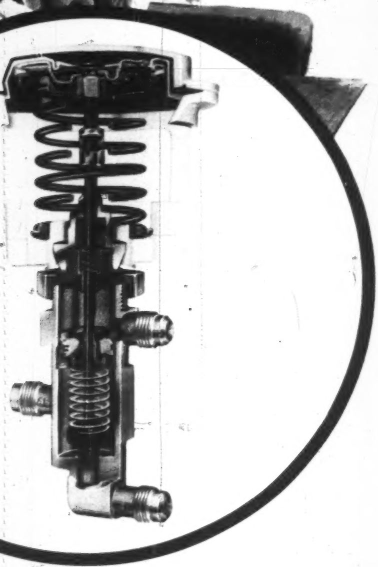


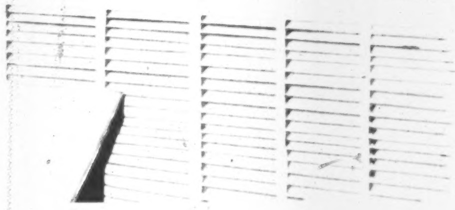
STATLER-HILTON HOTEL, BOSTON
fort to 1300 guest rooms with York 3-p
ing steam, turbine-driven centrifugal
sorption water chillers economically p

"I see extra space in every

I see a third pipe that delivers truly personalized comfort at far less cost!"





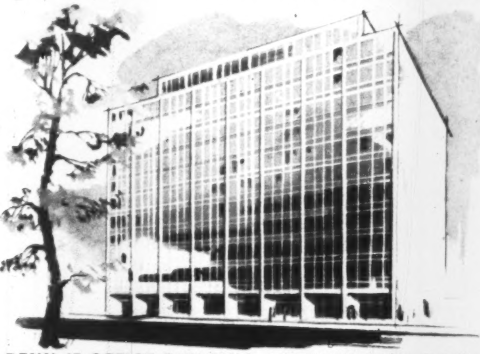


York offers a choice of 30 different models of induction units to match any application.

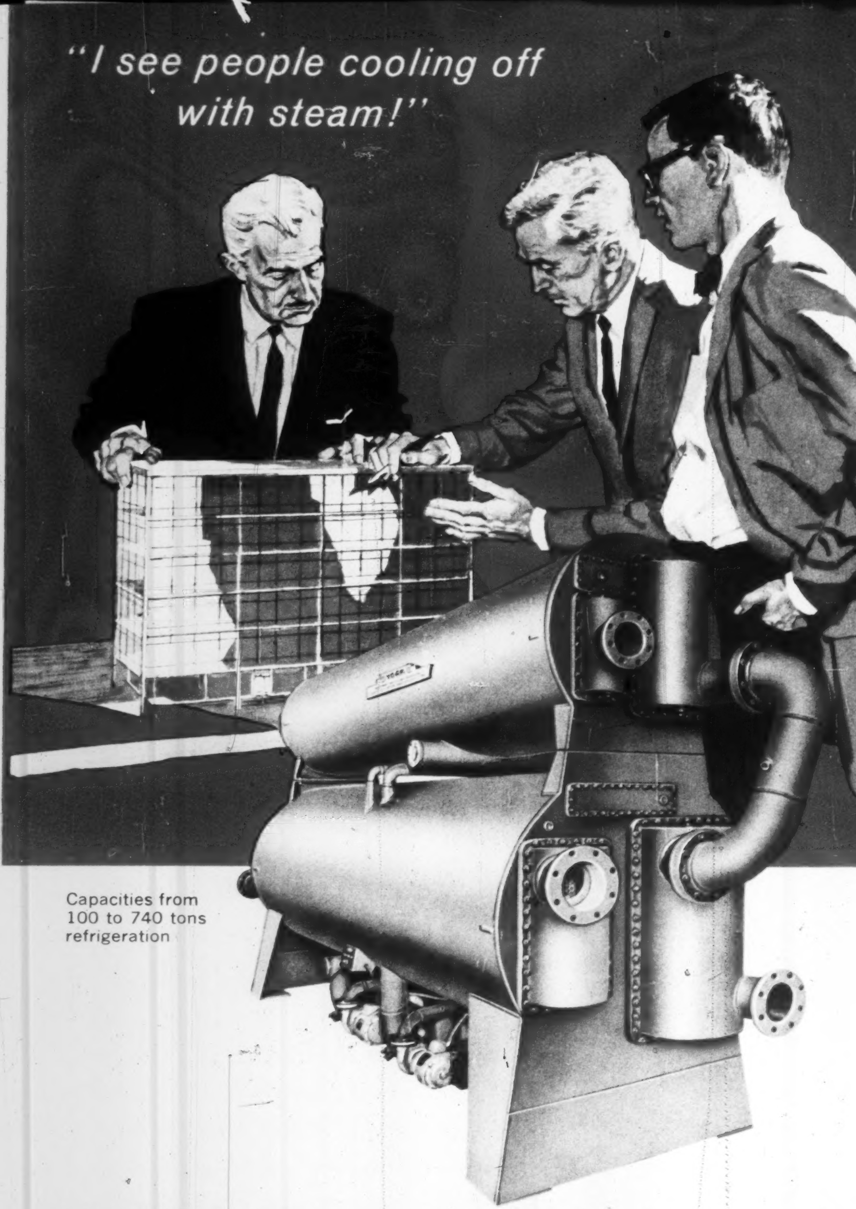
York automatic non-mixing 3-way control valve—heart of the 3-pipe system.

i-I Induction Systems in Action at...

TON, delivers instant com-
3-pipe system. Using exist-
gal and steam-powered ab-
y provide 812 tons cooling.



PENN 17 OFFICE BUILDING, WASHINGTON, D.C., will be heated and cooled with a York 3-pipe peripheral system consisting of 550 Hi-I Induction units. Two York Turbo pak water chillers will supply approximately 650 tons refrigeration.


"I see people cooling off with steam!"
YORK

Capacities from 100 to 740 tons refrigeration

YORK Lithium Bromide Absorptio

Carson Pirie

ALLEN MFG. CO., BLOOMFIELD, CONN., uses their excess boiler capacity in summer to provide cooling. A 230-ton York Absorption System air conditions the office and cafeteria and a 170-ton unit chills process water for plant usage.

CARSON PIRIE SC
200-ton York Absorp
office, cafeteria and
house building. They

YORK Lithium Bromide Absorption System Cools with Steam or Hot Water!

Uses less pump horsepower per ton of cooling!

Here is a unique system that can use an existing steam supply, either from boilers or district steam companies, to provide chilled water for comfort or process cooling. This means significant savings in operating costs over motor-driven compressor systems. Hot water or process fluids can also be used as the heat source.

York's Absorption System is virtually maintenance-free. Except for 3 small pumps and motors, it has no moving parts. The absence of major moving parts insures extremely quiet, vibration-free operation. This permits installation anywhere from basement to roof without special foundations or sound deadeners.

Installation costs are cut by eliminating large expensive starters and heavy electrical conduit. System operation is automatic and completely flexible, easily handling all load changes from overload down to zero.

In the York Absorption System, plain water is the refrigerant and lithium bromide, a simple salt, is the absorbent. Both these fluids are non-toxic and non-explosive, and never need replacement once charged into the system. York's advanced fluid distribution method assures quieter operation, rapid start-up and close control. A steam valve provides simple, direct capacity control.

ion Systems In Action At...

SCOTT & CO., CHICAGO, ILL., uses a
sorption System to cool 120,000 sq. ft. of
nd retail sales space in their 11-acre ware-
hey expect 25% savings in operating costs.

TISHMAN BUILDING, BUFFALO, N.Y., has a 530-ton York Absorption System supplying cooling to a York Induction Air Conditioning System. The entire refrigeration and heating plant is located on the roof of the 20-story building.

YORK Turbopak World's First Packaged Hermetic Centrifugal Water Chiller!

Takes 50% less space!

York's Hermetic Turbopak is a full 50% smaller than previous models, saving valuable floor space and enabling installation in confined or non-productive areas. Secret of the unit's amazing compactness is the exclusive York Borg-Warner power transmission, which permits a 50% reduction in the size of the compressor rotor.

To save on installation costs, the Turbopak is completely factory assembled and insulated. It is shipped and rigged as a single unit. There's no time-consuming aligning or refrigeration piping required on the job, just simple water and power connections.

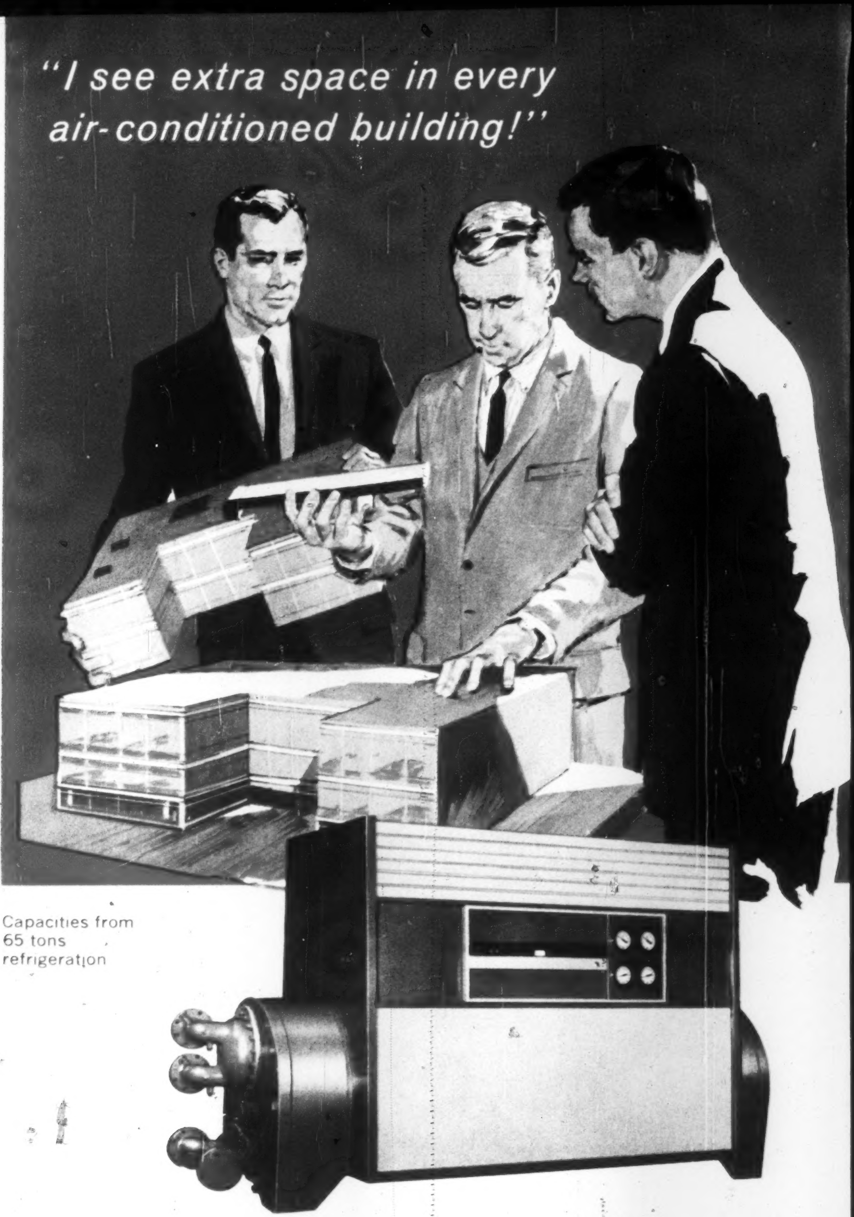
The York Turbopak is exceptionally quiet and vibration-free, permitting it to be located anywhere in the building that's convenient. The system is automatically controlled from an attractively styled, centrally located panel that is factory wired and mounted on the unit.

Efficient capacity reduction from 100% down to 5% is made possible by pre-rotation vanes. This automatic, continuously variable control method, introduced by York, gears refrigeration capacity directly to air conditioning load.

YORK Turbopak Water Chillers In

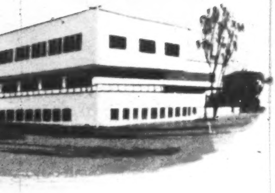
OWENS-CORNING FIBERGLAS CORP., GRANVILLE, O., requires precise temperature-humidity control and clean, dust-free atmosphere for this research and testing facility. Two 200 horsepower York Hermetic Turbopaks do the job.

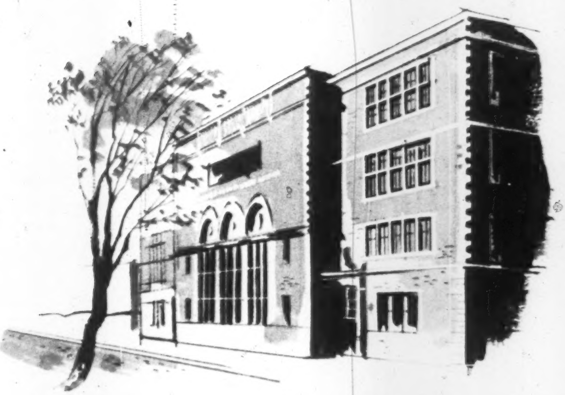
ILLINOIS POWER CO., DEC
horsepower Turbopak for air c
building. Unit's compactness
viously wasted. Expect to save


"I see extra space in every air-conditioned building!"

Capacities from
65 tons
refrigeration

Action At...





DECATUR, ILL., installed a 100
air conditioning their 2-story office
ess enabled location in space pre-
ave 15% in maintenance.

INSURANCE COMPANY OF NORTH AMERICA, RICHMOND, IND., makes use of a 125 horsepower York Hermetic Turbopak to air condition their modernized office building, greatly increasing the comfort and efficiency of the employees.

New

Plus

New

Complete YORK L

EXACTLY

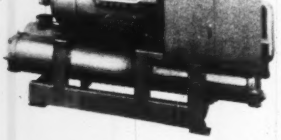
Wide Line—New fan-coil units from 800 to 36,000 cfm are design-matched to York cooling equipment to give a complete, balanced system. Units cool, heat, humidify, dehumidify, mix, filter and circulate the air for complete human comfort.

Maximum Flexibility—Modular construction gives design flexibility, cuts installation costs. Fan section rotates for air discharge in 3 directions. Coil section accommodates almost any combination of cooling, preheat and reheat coils.

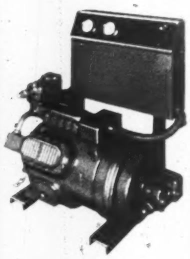
Long Life Bui
construction c
corrosion prot
tected with epo
vanized finish.
life-time lubrica

Quiet Operation
tween fan outl
maximum effici
Fans have forw
speed, low out
assure quietnes

Range of Equipme



PACKAGED WATER CHILLERS. Widest range of models, including a new dry-expansion line, to meet any application. Take 20% less floor space. 3 to 300 tons.



HERMETIC COMPRESSORS. Deliver more capacity per foot of installation space. Largest model takes only 7 sq. ft. of floor area. 10 to 45 tons refrigeration.

V/W
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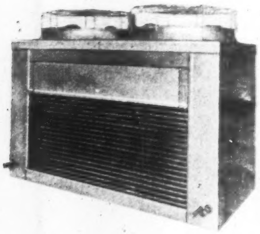
Expanded YORK L

FOR COMMERCIAL APPLI

Embassy water-cooled models with step-capacity design cut operating costs up to 15%. Cool a room or a building. 3 to 33 tons.



Champion air-cooled models eliminate costly water towers and connections. Install quickly and easily. 10 to 22½ tons capacity.

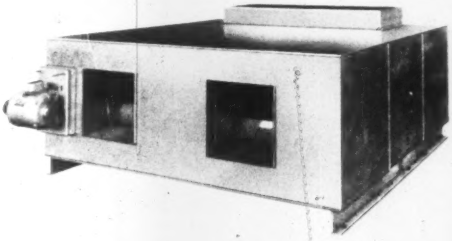
Heat
exclu
plete
wired

Line of Central-Station Air Cond

Y MATCHED TO OTHER YORK EQUIPMENT TO GIVE YOU AN EF

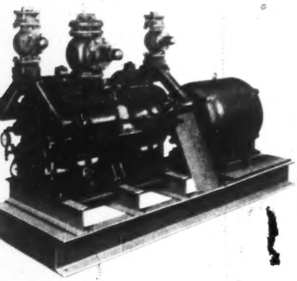
Built In—Rigid frame angle
n completely galvanized for
rotection. Fans double-pro-
epon coating baked over gal-
sh. Fan bearings permanently
ricated for dependability.

tion—Evase connection be-
utlet and unit outlet insures
fficiency at lowest noise level.
orward-curved blades for low
outlet velocity operation to
ness. Panels sound-insulated.

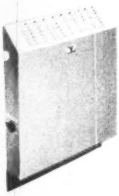


Modular design of this new line of York central fan-coil units provides unusual desig
and installation flexibility. Unit sections can be arranged horizontally or vertically
and either ceiling or floor mounted, to best utilize the space available. New lin
includes a wide choice of accessory equipment to meet individual requirements

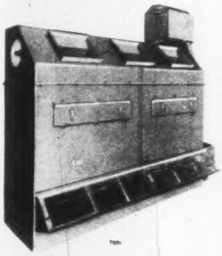
ent and Service to Meet Your Sp



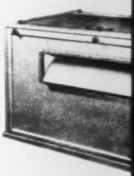
V/W COMPRESSORS. Halocar-
bon or Ammonia, up to 300 tons.
Automatic unloading down to 25%
capacity with power savings in al-
most direct proportion to load.



HYDRALINE. Attractive, semi-recessed fan-coil units and 3 to 15 ton factory packaged water chillers for hydronic heating and air conditioning systems.



ECONOMIZERS. Wide choice of evaporative condensers to save water and power. Sectional construction for installation ease and flexibility. Built to last.



ICE-MAKING
Saves cost of de
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Line of Packaged Air Conditionin

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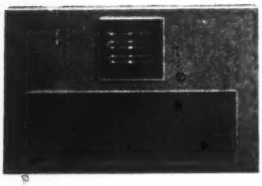
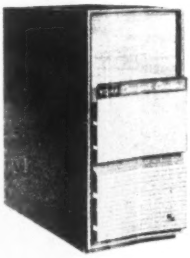
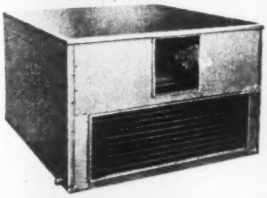


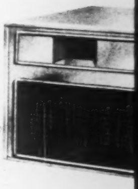
Heat Pumps heat and cool, have
exclusive electric defrosting. Com-
pletely factory assembled and
wired for fast installation.



Comfort Center heats and cools, humidifies and dehumidifies, purifies air electronically, all in one compact, attractively styled unit.



Heat Pumps heat and cool electrically, eliminate chimneys and fuel handling. Self-contained unit installs almost anywhere.



Pathfinder self-c
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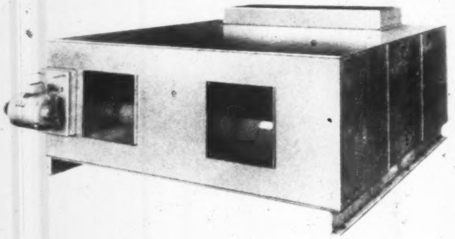
K Line of Central-Station Air Conditio

CTLY MATCHED TO OTHER YORK EQUIPMENT TO GIVE YOU AN EFFICIENT

Life Built In—Rigid frame angle
truction completely galvanized for
sion protection. Fans double-pro-
d with epon coating baked over gal-
zed finish. Fan bearings permanently
ime lubricated for dependability.

Operation—Evase connection be-
n fan outlet and unit outlet insures
mum efficiency at lowest noise level.
have forward-curved blades for low
l, low outlet velocity operation to
e quietness. Panels sound-insulated.



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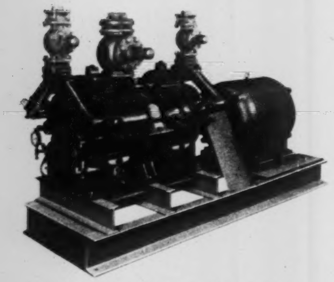

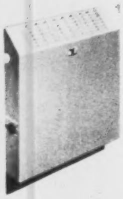

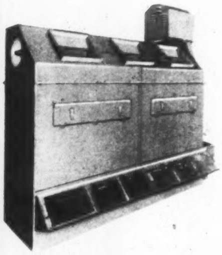

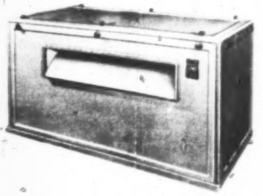

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V/W COMPRESSORS. Halocarbon or Ammonia, up to 300 tons. Automatic unloading down to 25% capacity with power savings in almost direct proportion to load.

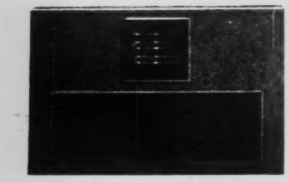
HYDRALINE. Attractive, semi-recessed fan-coil units and 3 to 15 ton factory packaged water chillers for hydronic heating and air conditioning systems.

ECONOMIZERS. Wide choice of evaporative condensers to save water and power. Sectional construction for installation ease and flexibility. Built to last.

ICE-MAKING EQUIPMENT. Saves cost of delivered ice, pays for itself. Automatic, factory packaged units with ice-making capacities from 100 lbs. to 12 tons.

K Line of Packaged Air Conditioning

APPLICATIONS



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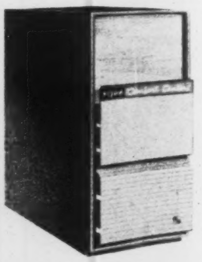

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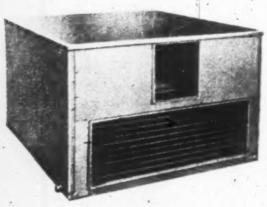
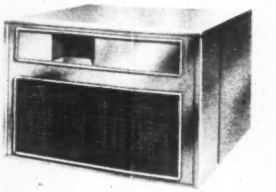


Heat Pumps heat and cool electrically, eliminate chimneys and fuel handling. Self-contained unit installs almost anywhere.

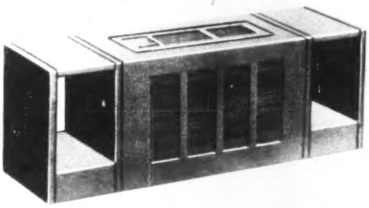


Pathfinder self-contained air conditioners cool a whole house, need no water. Locate anywhere there is access to outside air.

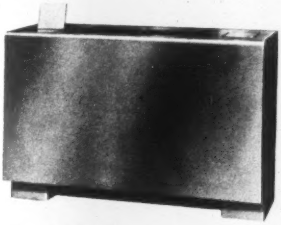
oning Units

NT, WELL-BALANCED SYSTEM

Plus THESE ADVANCE DESIGN AIR HANDLING UNITS



Hi-I Induction Air Conditioners in wall or floor models with 30 capacity sizes. High efficiency plenum and nozzle design improves air circulation, boosts capacity per cfm of primary air.



Fan-Coil Air Conditioners can supply year around heating and cooling without primary air equipment and ducts. Complete range of floor, wall and ceiling models for any application.

ific Requirements

NT.
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Fast Service from a Nationwide Network of

YORK PARTS DEPOTS

Strategically-located warehouses give fast, localized service on genuine York renewal parts, valves, fittings and oil. Helps minimize equipment downtime.

Continuous Peak Performance of Your Air-Conditioning System Assured by

YORK Certified Maintenance

Covers regular inspections, emergency service, complete maintenance including parts and labor, change-over or start-up and shut-down for a nominal, agreed-on-in-advance fee.

IAL APPLICATIONS

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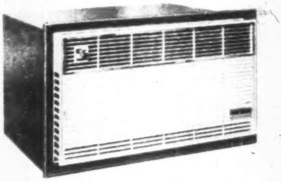
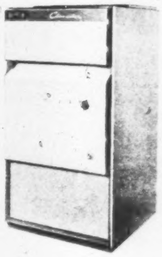
"Add-On" air conditioning units bring cooling economically to warm air heating systems; or install as a separate system.



Room Air Conditioners deliver powerful-quiet cooling. Three beautifully styled series, including year-round heat pump models.



Gas or Oil fired furnaces have Silver "V" burners that deliver more heat, more economically. Complete range of types and sizes.

HUSSEY COPPER

The Temperature-Sensitive Metal for Air Conditioning

THERMAL CONDUCTIVITY

Copper and the low-zinc brasses offer outstanding heat transfer rates. Hussey Copper and brass products have been recognized thermal material for 111 years.

CORROSION RESISTANCE

There's a Hussey copper alloy to meet most every corrosion problem; chemical, heat exchanger, processing equipment, refrigeration apparatus, etc.

STRENGTH

High-zinc brasses, nickel silvers, silicon bronzes and phosphor bronzes can provide tensile strength of up to 105,000 psi.

FORMING FACILITY

Hussey Copper has excellent hot and cold workability characteristics. Whether you bend, stamp, spin or machine, there's a Hussey copper to do your job.

JOINING

Hussey Copper and copper alloys lend themselves readily to soldering, brazing or welding by a variety of methods.

BEAUTY FINISH

Hussey copper is an attractive decorative material itself. It takes plating, anodizing, porcelain enamel and many kinds of finishes economically.

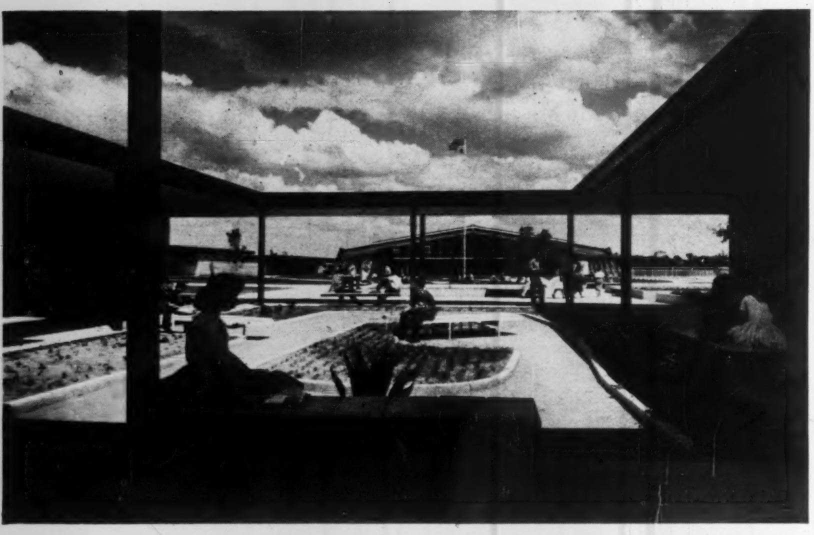
HUSSEY

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

C. G. HUSSEY & CO.
(Division of Copper Range Co.)
Rolling Mills and General Offices
PITTSBURGH 19, PA.

SEVEN FULLY STOCKED WAREHOUSES

PITTSBURGH (19)..............2850 Second Avenue
CLEVELAND (3)..............5318 St. Clair Avenue
CINCINNATI (37)..............1045 Meta Drive
CHICAGO (18)..............3900 N. Elston Avenue
ST. LOUIS (1)..............Globe Democrat Building
PHILADELPHIA (30)..............1632 Fairmount Avenue
NEW YORK, LONG ISLAND CITY (6)..............
..............34-39 Thirty-first Street



San Angelo Central High School, San Angelo, Texas

Ulric Meisel photo

primary and secondary pumping with B&G® PUMPS keeps horsepower down

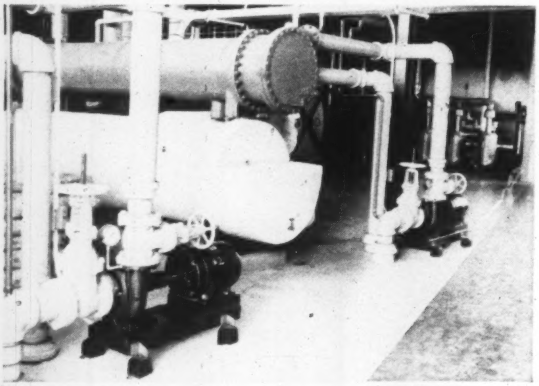
Architects: Caudill, Rowlett & Scott—
Houston, Texas, Oklahoma City, Okla.,
Corning, N. Y. and Stamford, Conn.
Associate Architect: Max D. Lovett—
San Angelo, Texas
Engineer: J. W. Hall—Bryan, Texas
Mechanical Contractor: R. M. Wells—
Quanah, Texas

The twelve buildings of this campus-type high school are heated and cooled with water. The pumping equipment consists of six B&G Universals, twelve Series 1510-B pumps and eight Boosters.

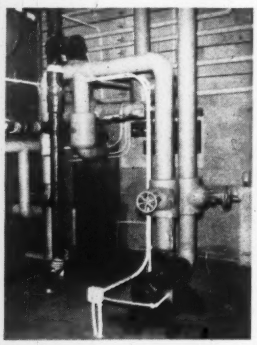
These pumps circulate single and dual coil units for heating and cooling and also the service water lines. Pump sizes range from 1/6 HP Boosters to 20 HP Universals.

To keep pumping horsepower at a minimum, a B&G primary and secondary pumping arrangement is employed, with the piping divided into three primary circuits. Each primary pump is sized to circulate the maximum demand for water through a single loop. The pump, therefore, need only be large enough to overcome the friction head in the primary piping circuit.

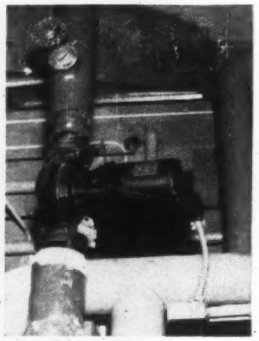
Secondary pumps in each building, and for each major zone in each building, handle water quantities out of these main circuits and overcome the balance of the head in the system.



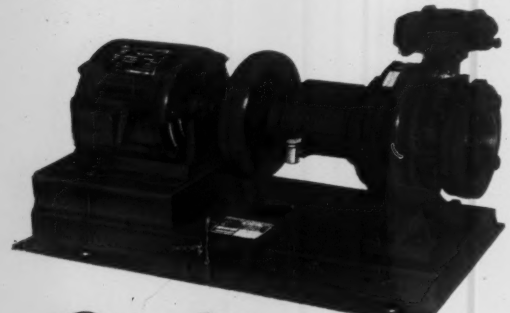
Two B&G Pumps for circulating chilled water



B&G Universal Pump for circulating heated water through primary circuit



B&G Booster circulating one of the secondary circuits



B&G Universal Pump

B&G Booster

BELL & GOSSETT COMPANY
Dept. GA-5, Morton Grove, Illinois
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

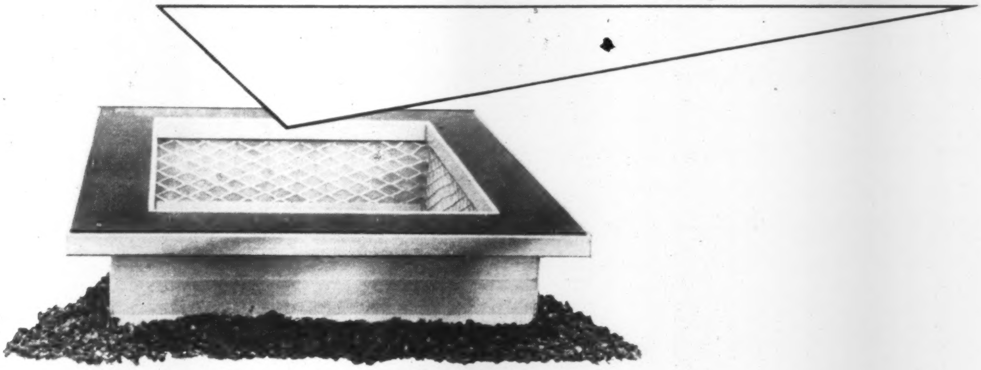
IT'S WHAT GOES INTO PENN'S SONOTROL CURB THAT MAKES IT SO DARN GOOD!

Ventilators fit like a glove when there's a self-flashing
EXTRUDED ALUMINUM
SONOTROL CURB*
on the job!

The newest way to curb roof ventilators eliminates the haphazards of field construction. Instead, you place your order for curb, ventilator and damper . . . everything fits . . . and there are no delays!

Penn devoted years to developing the Sonotrol Curb. Already in use in many installations, they're non-porous, seamless and weathertight! All aluminum construction reduces roof loading . . . makes them easy to install. Special acoustical insulated lining quiets roof exhauster sounds appreciably, and eliminates condensation.

Get into this modern way to curb now by requesting Bulletin SCE-89 from your local Penn Ventilator man or write direct.



PENN VENTILATOR CO., Inc.
PHILADELPHIA 40, PENNA.

A leading manufacturer of Powered and Gravity Roof Exhausters and Accessory Equipment for over 30 years.

Representatives and Distributors in Principal Cities
Charter Member of AMCA

*Your roof exhauster won't be as quiet as it should be unless you use the Sonotrol Curb

Keflex Manufacturing Division
U. S. Flexible Metallic Tubing Co.
Since 1905

KEFLEX

LAMINATED STAINLESS STEEL BELLOWS

General Offices — 63 Main St.,
San Francisco 5, Calif.
Factories — Los Angeles —
San Francisco
Sales Offices — Agents in Principal
Cities of U. S. and Canada

KEFLEX QUADRA-SIDE EXPANSION COMPENSATORS

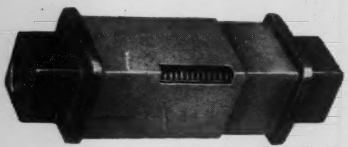
FOR STEAM AND HOT WATER HEATING SYSTEMS USED WITH CONVECTOR AND FIN TUBE BASEBOARD RADIATION UNITS IN SCHOOLS, HOSPITALS, OFFICES AND COMMERCIAL INSTALLATIONS

TYPE 7 Q square brass telescoping case protects laminated stainless steel bellows from torsion, squirm, misalignment and external damage. Compensators are used in high and low pressure hot water supply lines, risers and for baseboard radiation. Extra flexibility provides maximum cyclic life. Units are very compact and rugged. Sizes ¾″ thru 3″. Pressures to 300 PSI. Temperatures to 800° F. Traverse: Single Units, total 2″ (1-½″ compression, ½″ extension) Dual units available.

TYPE 11 Q-T has heavy square telescoping case and laminated stainless steel bellows. For use in risers and with baseboard radiation. Test pressure 150 PSI, working pressure 100 PSI, temperatures to 300° F. Traverse: Total 1″ (¾″ compression, ¼″ extension).

TYPE 7 Q WITH BRASS FEMALE THREADED ENDS

Working Pres. 300 PSI Maximum
Temp. 800 F



Pat. Pend.

Nom. I.P.S.	Overall Length	Max. O.D.	Wt. #
¾″-1.00″-1.25″	6.50″	2.00″	2
1.50	6.50	2.50	4
2.00	6.50	3.00	5
2.50	6.50	3.50	6
3.00	6.50	4.00	9

TYPE 7 Q-T WITH COPPER TUBE ENDS

Maximum Pres. 200 PSI Maximum
Temp. 300 F

Pat. Pend.

To Fit Copper Tubing		Overall Length	Max. O.D.	Wt. #
Nominal I.D.	Actual O.D.			
¾″	⅞″	6.50″	2.00″	1½
1	1⅛	6.50	2.00	1½
1¼	1⅜	6.50	2.00	1½
1½	1⅝	9.00	2.50	3½
2	2⅛	10.00	3.00	4½
2½	2⅝	10.75	3.50	5½
3	3⅛	11.50	4.00	8¼

TYPE 11 Q-T WITH COPPER TUBE ENDS

Maximum Pres. 100 PSI Maximum
Temp. 300° F

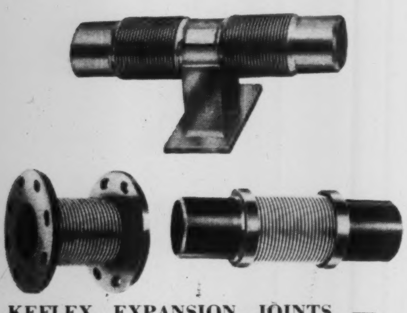
KEFLEX
TYPE 11-QT
KEFLEX MFG. DIV.
SAN FRANCISCO

Pat. Pend.

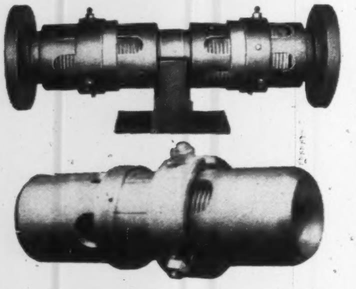
To Fit Copper Tubing		Overall Length	Max. O.D.	Wt. #
Normal I.D.	Actual O.D.			
¾″	⅞″	4.50″	1.50″	1¼
1	1⅛	4.50	1.50	1¼
1¼	1⅜	4.50	1.75	1½
1½	1⅝	4.50	2.25	3
2	2⅛	4.50	2.75	4

EXPANSION JOINTS—VIBRATION ABSORBERS—FLEXIBLE CONNECTORS—PIPE GUIDES

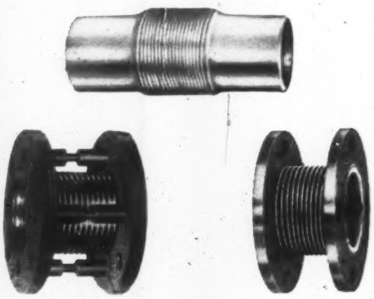
Force Required to Compress Keflex Expansion Joints Their Full Rated Traverse is Usually Less Than 100 Lbs., Total



KEFLEX EXPANSION JOINTS — corrugated, packless type for steam and hot water heating systems and process piping. Laminated stainless steel bellows with internal liner guides and stainless steel contour control rings. Weld ends, or flanges. Outside shrouds and intermediate anchor bases available. Sizes 2″ through 48″. Pressures 70 to 450 PSI. Temperatures to 800° F. Furnished for various required traverses.

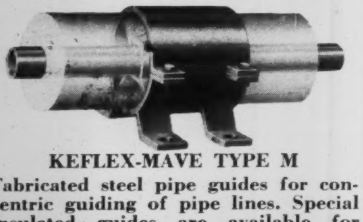


KEFLEX-KETROL CONTROLLED EXPANSION JOINTS — positive protection against torsion. For use in pipe lines to compensate for expansion and contraction. Shroud has intermeshing fingers providing concentric guiding and protection against squirm, torsion, and external damage to laminated stainless steel bellows. Designed for high pressure, high temperature hot water service. Movement is controlled by limit stops. Sizes 2″ through 48″. Pressures to 450 PSI and temperatures to 800° F.



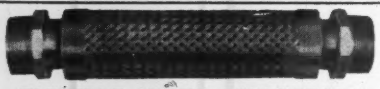
KEFLEX FLEXIBLE CONNECTORS AND VIBRATION ABSORBERS — to absorb vibration from pumps, chillers, and compressors. Serves to relieve stress on pump volute when piping is misaligned. Extra flexibility of laminated stainless steel construction produces long cyclic life. Compact units save space and are easy to install. Available with or without tie rods. Sizes 2″ through 48″. Pressures to 450 PSI and temperatures to 800° F.

Modified Types are available for special conditions requiring higher pressure, temperatures, traverse, or combination deflections.

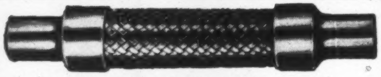


KEFLEX-MAVE TYPE M

Fabricated steel pipe guides for concentric guiding of pipe lines. Special insulated guides are available for chilled water.



FLEXIBLE "BMH" CONNECTORS



"USF" BRONZE VIBRATION ABSORBERS

Braided bronze Metal Hose assemblies made in standard lengths. Usually used as flexible connectors on pumps and other mechanical equipment for heating and air conditioning service. Available with threaded male ends, flanges, and copper tube sweat ends.

ACE Plastic Pipe

85 to 100% of your corrosion-resistant piping needs now available from 1 source

There is no single material for chemical piping that can handle all corrosive fluids . . . and do it economically. To meet all needs, American Hard Rubber Company has developed and refined no less than nine basic types of corrosion-resistant rubber and plastic pipe and tubing . . . plus a wide variety of fittings, valves, pumps, and other equipment for assembling completely protected chemical systems. ACE distributors and field engineers will be happy to make recommendations . . . call your ACE supplier first for the quickest, correct answer.

	WHICH PIPE SHOULD YOU USE . . .	WHERE . . . WHEN?
ACE-ITE Threaded Pipe ½" to 6" Fittings ½" to 6" Valves ½" to 2" *Bulletin 80*	General purpose rubber-plastic blend. Tough, impact resistant. Odorless, tasteless. Economical.	General purpose piping. Handles most common chemicals to 170°F. Moderate first cost.
ACE RIVICLOR Threaded Pipe ½" to 2" Fittings ½" to 2" Valves ½" to 2" *Bulletin CE-56*	Rigid plastic, special PVC. Outstanding aging characteristics. Good cold impact strength.	Lies between Saran and Parian. Not affected by most inorganic acids and alkalis. Good for many organics also.
ACE SUPPLEX Flexible Pipe ½" to 2" Fittings ½" to 2" *Bulletin CE-57*	Non-toxic, flexible polyethylene pipe, NSF-approved for drinking water. Ideal for jet wells, water distribution lines, drain lines, etc.	Excellent chemical resistance, similar to Parian rigid pipe. Supplex uses insert type fittings instead of screwed fittings.
ACE TEMPRON Threaded Pipe ¾" to 8" Fittings ¾" to 6" *Bulletin 96-A*	For hot corrosives to 260-275 deg. F. Rigidity and resistance better than previous nitriles.	Best anywhere for hot inorganic chemicals, acids. Also unusually wide variety of organics at room temp.
RUBBER-LINED STEEL Flanged Pipe 1½" to 24" & up Fittings 1½" to 24" & up Valves ½" to 24" *Bulletin CE-52*	Strength and pressures of steel plus resistance of hard rubber. Soft rubber interlayer aids shock resistance.	Finest resistance to alkalis, most inorganic acids, many organic acids, all salts. Ideal for bleaches.
ACE SARAN Threaded Pipe ½" to 6" Tubing ⅛" to ¾" Fittings ⅛" to 2" Valves ½" to 2" *Bulletin CE-58*	Odorless, tasteless, general-purpose rigid pipe and semi-flexible tubing. High pressures.	Excellent . . . not affected by most inorganic acids and alkalis. High resistance to most organics.
ACE HARD RUBBER Pipe ¼" to 8" Flanged Fittings 1½" to 8" Threaded Fittings ¼" to 8" Many Valve Types ⅛" to 5" *Bulletin CE-51*	The oldest, still tops. Widest range of fittings of any rigid non-metallic pipe.	Extreme resistance to alkalis, most inorganic acids, many organic acids, all salts. Ideal for chlorine, fluorine.
ACE PARIAN Threaded Pipe ½" to 2" *Bulletin 351*	Odorless, tasteless, rigid polyethylene. Not strongest plastic, but best for sub-zero uses.	Best resistance of any plastic at room temp. except to acetic acid. Good for alkalis, acids, many organics.
ACE-FLEX Flexible Tubing 0.120" to 1" I.D. *Bulletin 66*	General-purpose transparent flexible tubing. Non-toxic, odorless, tasteless. Can steam-sterilize.	Very good resistance to most inorganic acids and alkalis. Resists many organics at room temperature.

more RESISTANT TO **more** CHEMICALS

Supplex, Ace-Ite, and Riviclor are approved by National Sanitation Foundation for drinking water.

nSf

ACE rubber and plastic products

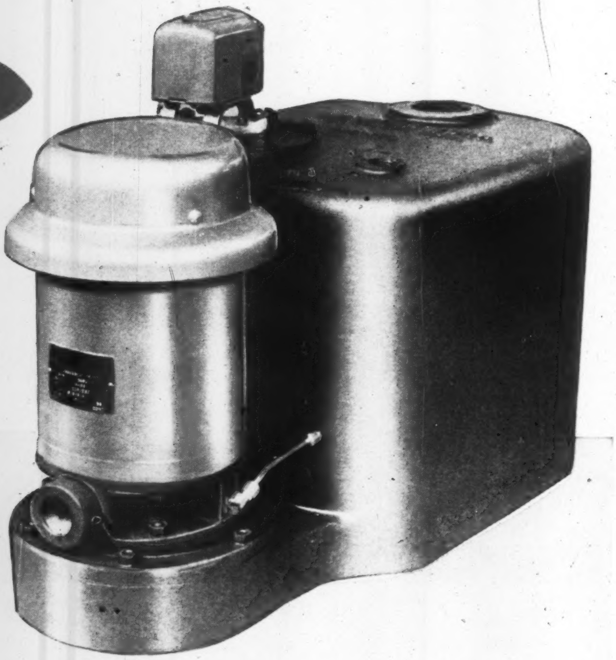
AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

NEW!

improved

CCVS

SUPERIOR FEATURES

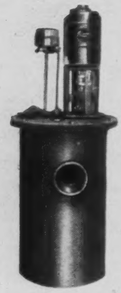


- Vertical close-coupled pump and motor unit bolted to receiver.
- Cast iron receiver for long wear.
- Low return inlets for convenient piping of return close to floor.
- Two receiver inlets on side and top of receiver.
- Stainless steel motor shaft prevents corrosion.
- Quiet operation is proof of vertical pump design.
- Installation on floor level or in pit.
- Mechanical shaft-seal eliminates all leakage from pump shaft.
- No close clearance, efficiency is maintained even at 3500 RPM motor speed.
- Completely assembled ready for return and discharge connections.

Call the nearest Skidmore representative or write for bulletin 21-C.

Representatives in All Principal Cities

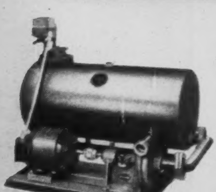
There's a wide range of types and capacities for every heating pump need. Let Skidmore advise you on your next tough job.



TYPE UV

Type UV Condensation Pump is designed for below floor level returns, and is built in single and duplex units.

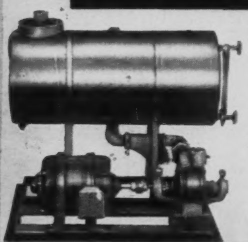
Write for *Bulletin No. 19-A*



TYPE HS

Type HS Pump is recognized for its dependable low operating cost. Capacities range from 1,000 to 65,000 sq. ft. EDR and pressures from 10 to 75 pounds.

Write for *Bulletin No. 14-A*



TYPE TM

Type TM High Pressure Turbine Pump. Designed for pressures up to 150 pounds and boilers to 250 H.P.

Write for *Bulletin No. 17*

SKIDMORE PUMPS

SKIDMORE CORPORATION ST. JOSEPH, MICHIGAN

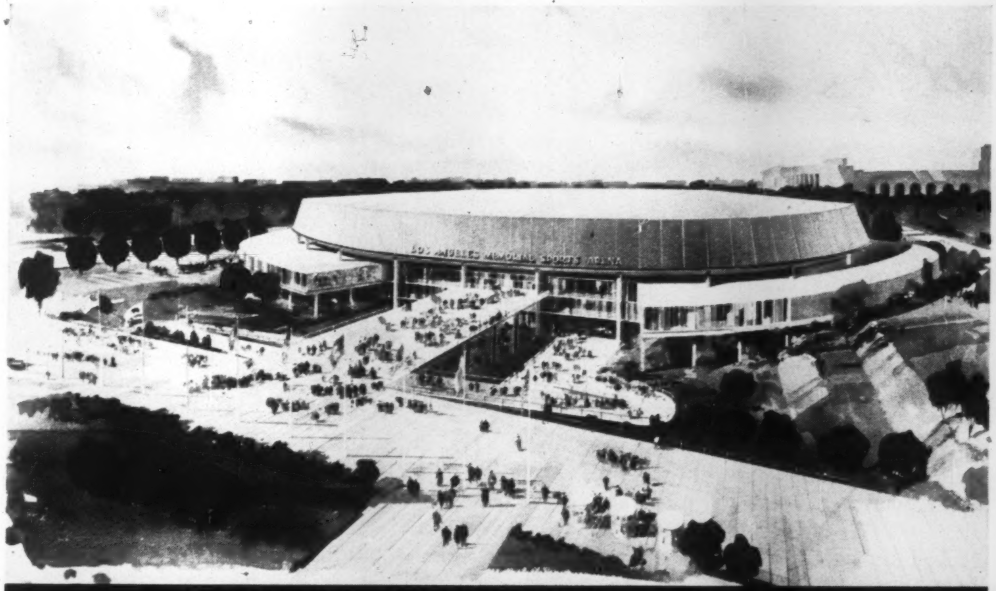
Engineering the temperature...

WITH RECOLD IN THE LOS ANGELES SPORTS ARENA

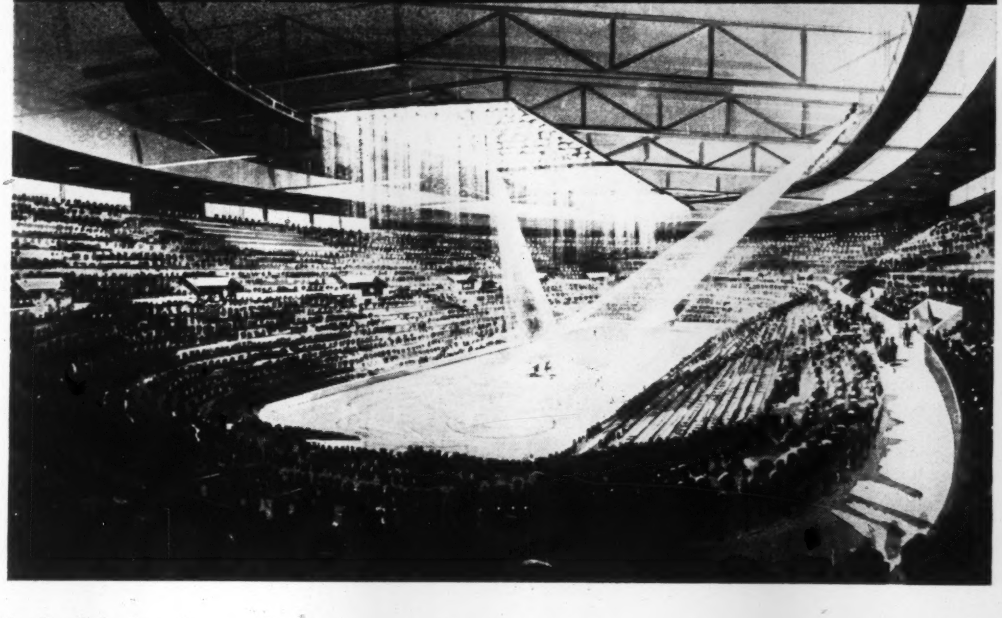
The new 22,400-seat Memorial Sports Arena establishes Los Angeles as the sports capitol of the nation. Recold units supply over 672,800 CFM of heating and air conditioning for this vast building.

RECOLD CORPORATION
7250 East Slauson Avenue, Los Angeles 22, California

RECOLD


LOS ANGELES MEMORIAL SPORTS ARENA

Designed by: Welton Becket & Associates, Architects & Engineers
Air-Conditioning Installed by Western Air & Refrigeration, Inc.



Now—a new appearance concept for low-budget commercial installations

The "Power-Plant" Look

with Johns-Manville FIBROCEL Insulation!

Now you can bring the traditionally fine appearance and performance excellence of your power plant work to general commercial and industrial installations . . . with Johns-Manville Fibrocel® Insulation!

Why these power plant advantages? Simply because Fibrocel is molded! The only commercial insulation made (by a precision metal mold) to near-perfect roundness, with unmatched uniformity of size and line.

This means an immediate end to costly finishing, heavy jacketing, needless pointing up of cracks and apertures. Instead, Fibrocel gives you a tighter, better looking installation just as it is applied. Pipelines are gun-barrel straight, firm end to end. The look of a power plant!

Fibrocel's dimensional uniformity again pays off in fuel savings—pipe is always "dead center," with lengths butted tight to provide maximum insulating effectiveness.

Let us send you the informative new brochure, IN-155A. It gives you full details on Fibrocel's thermal performance. Illustrations show why Fibrocel installs easier . . . takes abuse, too. Keeps its fine appearance and performance excellence for the life of the installation. Write for it today!

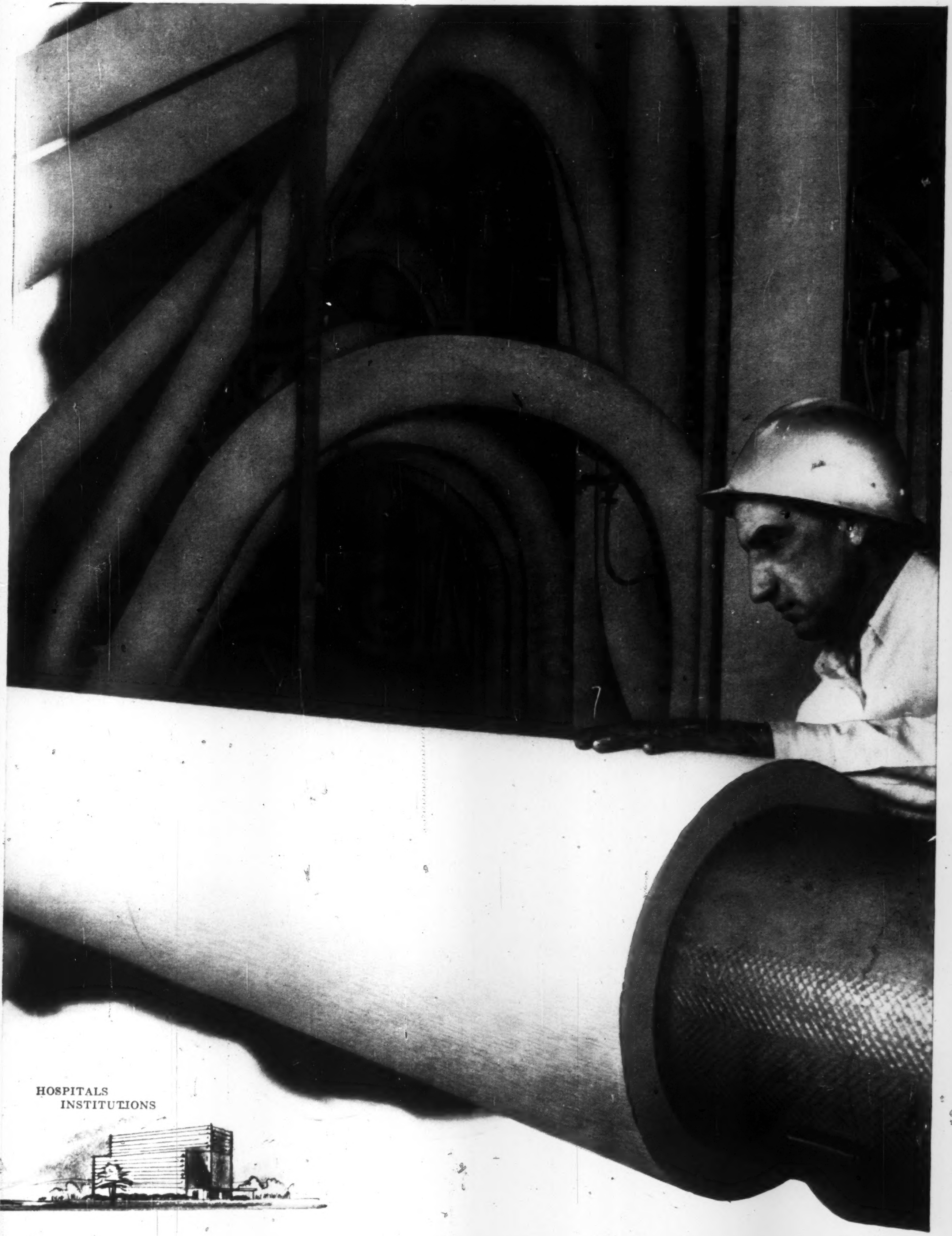
Address Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

JOHNS-MANVILLE JM PRODUCTS

JOHNS-MANVILLE

. . . Specify Fibrocel for the "POWER PLANT" look in installations like these (35F to 300F)

SCHOOLS
COLLEGES
HOTELS
APARTMENTS
STORES
WAREHOUSES
PLANTS
OFFICE BUILDINGS



HOSPITALS
INSTITUTIONS

You get these benefits when you install YARWAY GUN-PAKT EXPANSION JOINTS

Why do industrial plants, institutions, universities and central heating plants SPECIFY and INSTALL Yarway Gun-Pakt Expansion Joints?

Because with Yarway you get:

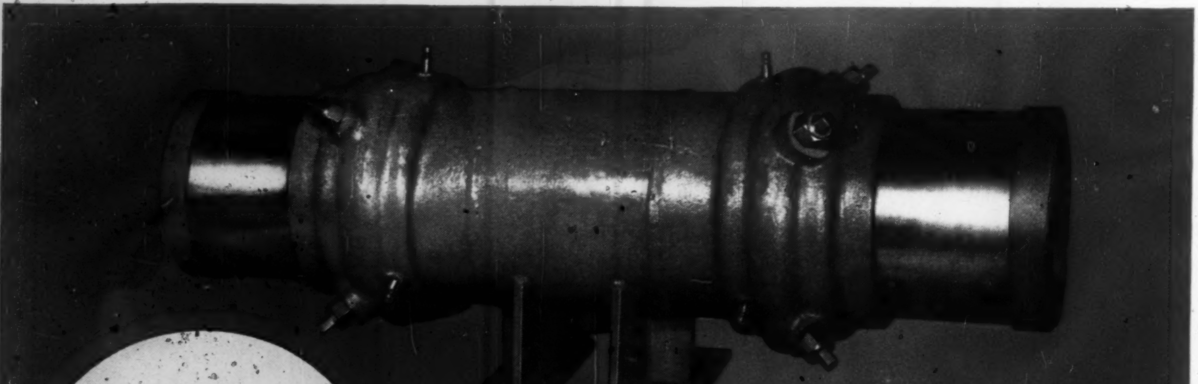
- **CONTINUOUS SERVICE**
  Costly shutdowns are eliminated. Packing is seldom necessary but may be added *under full line pressure.* No vents are necessary. Never needs repacking.
- **RUGGED DEPENDABILITY ALL STEEL CONSTRUCTION**
  Durable chromium plated seamless steel sleeves. No chance *of metal fatigue.* Wrought steel bases provide rugged, positive anchorage.
- **INTERNAL AND EXTERNAL GUIDES**
  Positive alignment of sleeve in stuffing box *—where it counts!*
- **LIGHT WEIGHT, STREAMLINED DESIGN**
  Requires less space to install—less space to maintain—smaller manholes.

Many Gun-Pakt joints have been *in service over 25 years with only nominal maintenance*—no major repairs or periodic overhauls. Maintenance costs are negligible—records show average to be one manhour and 65 cents worth of packing per joint per year. AND—NEVER A SHUTDOWN FOR REPACKING!

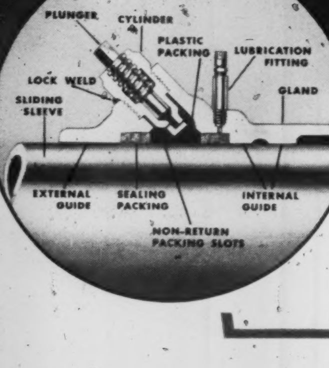
YARWAY field engineers are qualified to advise on installation and service—at no cost to you. Investigate today. Write for Bulletin EJ 1917 ('59).

FOR YOUR NEXT PIPELINE JOB—BE SAFE—BE SURE! SPECIFY YARWAY GUN-PAKT.

YARNALL-WARING COMPANY
107 Mermaid Avenue, Philadelphia 18, Pa.
BRANCH OFFICES IN PRINCIPAL CITIES

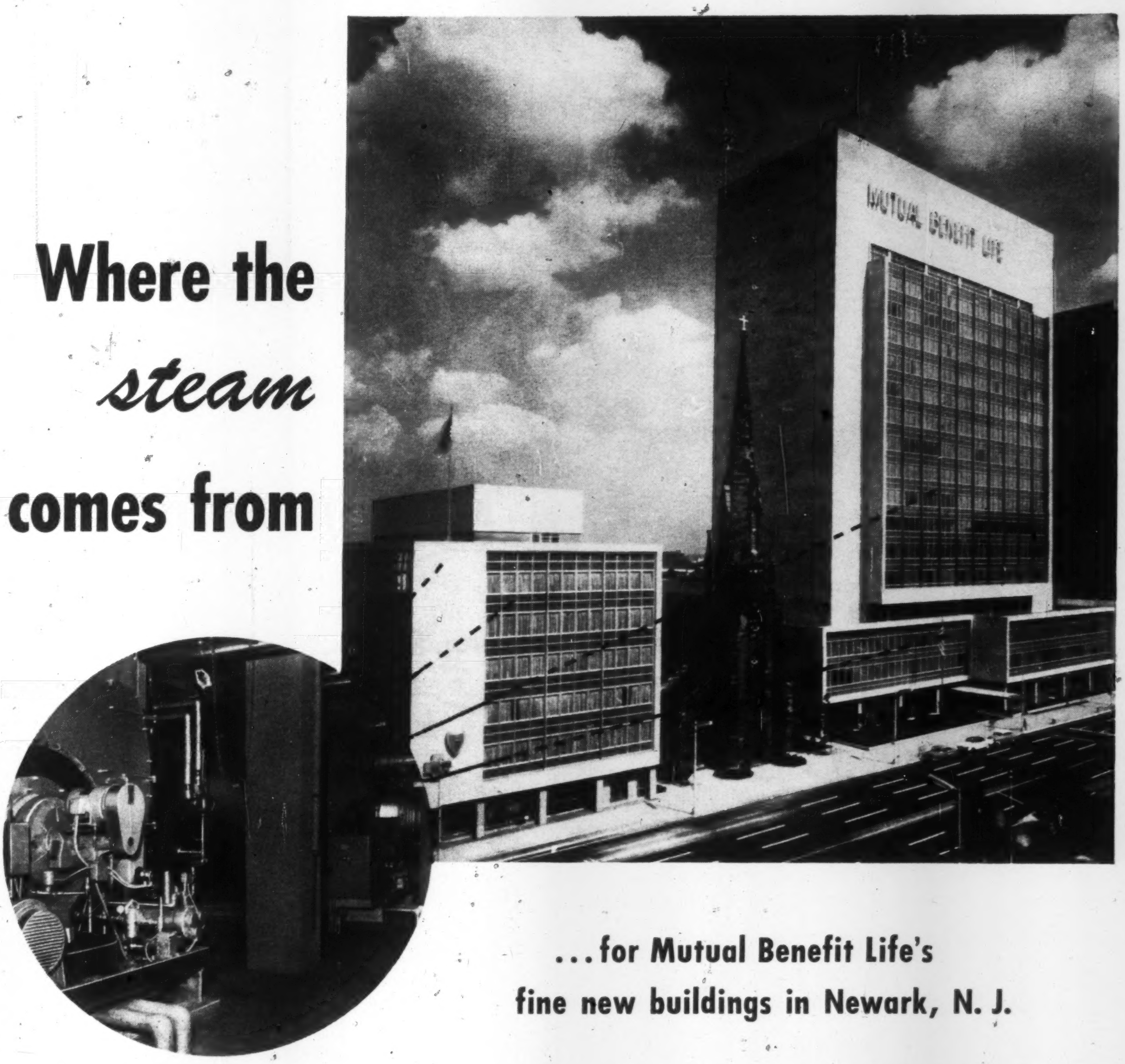


10" Yarway Type W Gun-Pakt double-end joint with welding ends. 4 guns each end.



Cross-section of Gun-Pakt feature. To add packing, just insert a plug and turn the plunger. Note non-return packing slots.

YARWAY GUN-PAKT



Where the *steam* comes from

...for Mutual Benefit Life's fine new buildings in Newark, N. J.

Complete firing system in one package. Every factor that affects firing efficiency is engineered into the unit at the factory. The unit includes: (1) Single or dual-fuel burner, with complete fuel handling systems. (2) Forced draft air supply. (3) Enclosed control panel, with instruments mounted, factory wired and tested, and with signal lights and gauges that afford a complete reading at a glance. In the oil-gas units, fuels can be switched automatically, or with the simple flick of a switch.

Fire low cost residual oils

The heavy residual fuel oils (No. 5 and 6) have higher heat value than light heating oils, yet cost less per gallon.

The Iron Fireman boiler-burner units shown here fire these sluggish oils with complete dependability. They protect against fuel emergencies because they can fire *any* grade of oil, light or heavy.

Gas or oil—switch fuels instantly

Dual-fuel models fire either gas or oil, and can be switched either by manual or automatic controls. In some areas gas rates are substantially less for customers whose steam plants switch automatically from gas to oil firing when outdoor temperature falls below a certain level, relieving the load on main gas lines when demand is highest.

Fires all types of boilers

Iron Fireman residual oil firing (with or without gas) is available in complete boiler-burner units ready for service connections, or as a package firing system that can be applied to any type of boiler.

Send coupon for further information

IRON FIREMAN®

AUTOMATIC FIRING EQUIPMENT

FOR OIL · GAS · COAL

IRON FIREMAN MANUFACTURING COMPANY
3004 West 106th Street, Cleveland 11, Ohio
(in Canada, 80 Ward Street, Toronto, Ontario)

Please send information on Iron Fireman forced draft firing for oil, gas or oil-gas combination.

Name ....
Address ....
City .... State ....

Schemenauer

UNIT VENTILATORS

for Institutional or Commercial Use

SUBSTANTIAL SAVINGS 3 WAYS—

EFFICIENT HEATING · MINIMUM MAINTENANCE · PREMIUM QUALITY—*Competitively Priced*

Schemenauer, dedicated to building the finest in heating and ventilating equipment, offers a variety of models to meet modern day school needs. A complete selection of matching components assures adaptability to all installation requirements, without costly custom designing.

The Schemenauer representative in your area will be glad to assist you in the selection and application of Schemenauer equipment. Investigate the facts and you will quickly recognize the inherent quality . . . . the attractive design features . . . and the all around durability built into each Schemenauer Unit.

Where quality is a major concern in your school building program . . . make sure you specify Schemenauer Unit Ventilators.

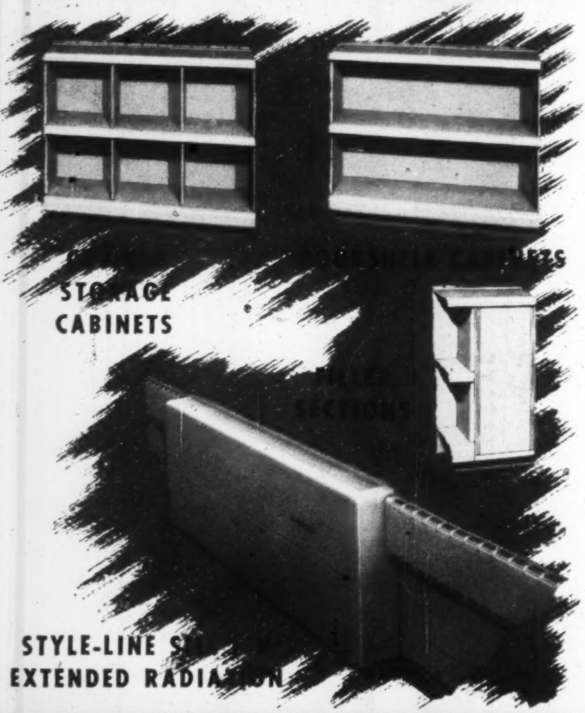
SEE SCHEMENAUER EQUIPMENT AT THE FOLLOWING EXHIBITS:

2nd Southwest Heating & Air Conditioning Exposition, Dallas, Texas — Feb. 1-4, 1960
Booth Nos. 1424-1428

American Association of School Administrators Exhibit, Atlantic City, New Jersey — Feb. 13-18, 1960
Booth Nos. 1003-1005-1007

Western Air Conditioning, Heating, Ventilating, & Refrigerating Exhibit, Los Angeles, Calif.—April 27-30, 1960

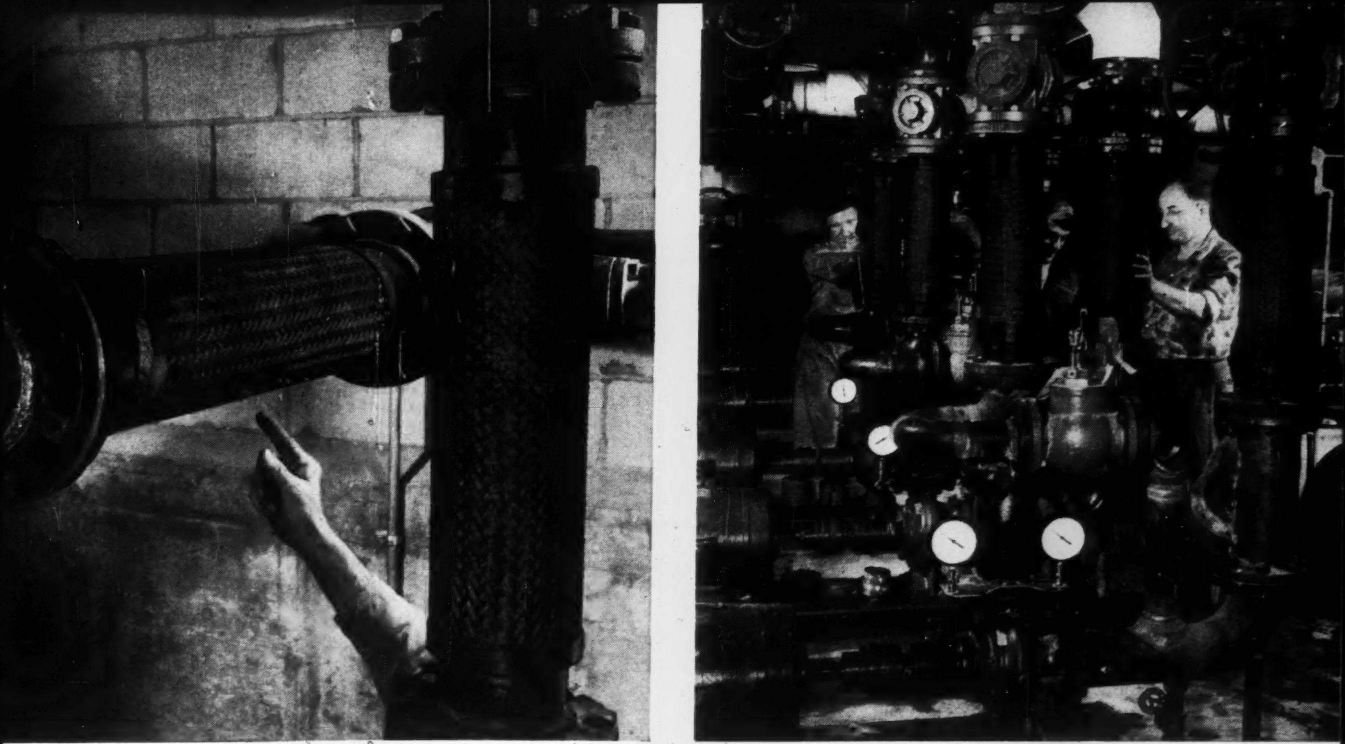
Also A COMPLETE LINE OF MATCHING COMPONENTS



Manufacturers of

FINNED TUBE PRODUCTS · COMMERCIAL RADIATION · HEATING & VENTILATING EQUIPMENT

SCHEMENAUER MANUFACTURING CO.
HOLLAND, OHIO



PHOTOS PROVIDED through the courtesy of **GRAFLEX, INC.**, manufacturers of precision photographic, electronic and optical products, at the company's new multimillion-dollar Rochester, N. Y., plant.

New Flexpipe flexible bronze tubing isolates vibration, provides expansion joint for Graflex, Inc.

THE PROBLEM:

In a heating and air conditioning system, the temperature range of water and condensate varies over a 180°F. range. Some means were required to provide for expansion and contraction in the system without putting undue stress on rigid pipe and to confine the vibration to the compressors.

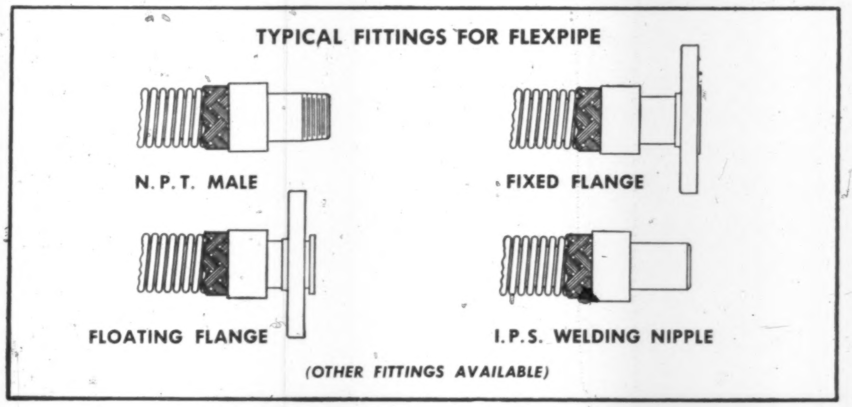
THE SOLUTION

Use of new large-size (4″, 5″ and 6″ I.D.) Flexpipe—flexible bronze tubing assemblies complete with end fittings.

Flexpipe connectors — in standard sizes — can solve tough problems for you, too, wherever air, gas, oil, steam or water must be conveyed, because Flexpipe:

- Has extreme flexibility that lessens chances of breakage and leakage from expansion and contraction.
- Needs little maintenance attention.
- Dampens noise, absorbs vibration, takes up movement, solves misalignment problems.
- Cuts installation costs (does away with time and material costs of rigid conduit requiring elbows, couplings, short runs of pipe, etc.).
- Makes installations quick and easy —especially in cramped quarters.

TYPICAL FITTINGS FOR FLEXPIPE



(OTHER FITTINGS AVAILABLE)

CONSTRUCTION: Inner hose corrugated for flexibility; wire braid over inner hose for added strength. Available in bronze, steel and stainless steel.

WHERE TO BUY:

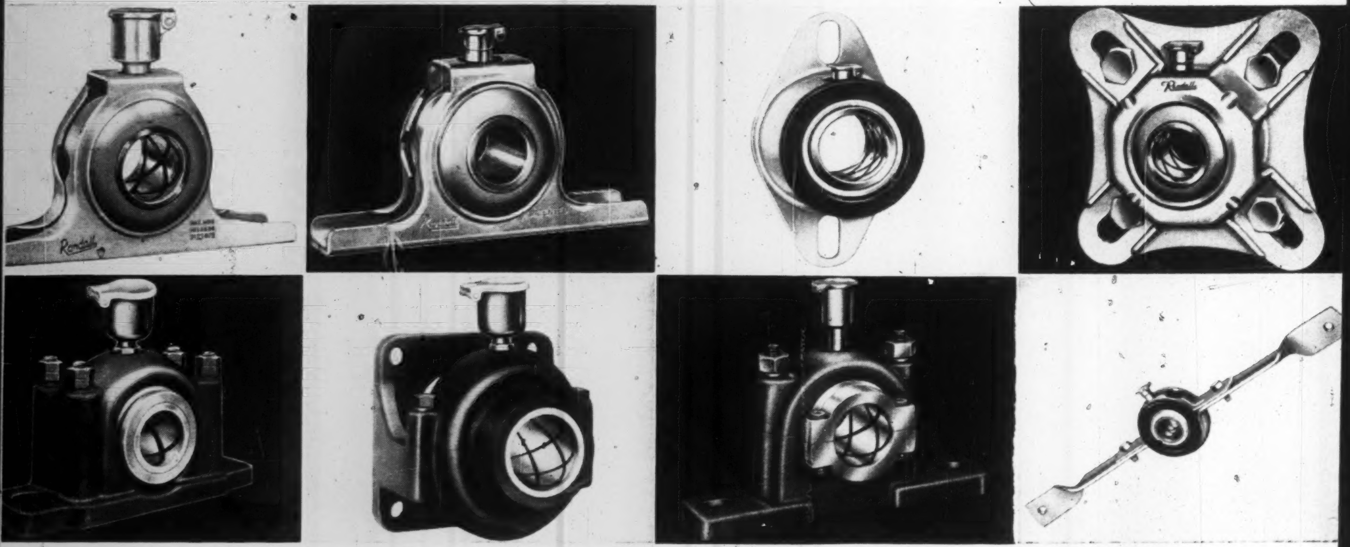
Leading wholesaler distributors can provide you with information about Flexpipe in large sizes. These same distributors can show you samples and answer your questions about service applications for Flexpipe connectors in convenient standard sizes from ¾″ up to 16″ I.D. For the name and address of the distributor serving your area, or for more detailed information, write to: Anaconda Metal Hose Division, The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

58167 Rev

Flexpipe®
AN
ANACONDA®
PRODUCT

Randall

leading developer and manufacturer of the air moving industry's most dependable bearings



There's a Quiet...Self-Aligning...Self-Lubricating Randall Sleeve Bearing Assembly for Every Type Application

Controlled automatic lubrication . . . outstanding efficiency . . . and extended periods of operation without maintenance are the advantages Randall Bronze Sleeve Bearing Pillow Blocks provide for every type of application. This superior performance is the result of Randall's exclusive design and manufacturing skill.

There are no moving parts in the Randall bearing assembly. The "DEEP-WELL"® lubricant reservoir feeds the proper lubrication to all parts of the bearing surface through porous graphite plugs and grooves. This combination of oil and graphite lubrication in just the right quantity for any operating condition provides a perfect non-metallic cushion between the shaft and bearing surface so that the shaft spins smoothly and silently. Alignment of the bearing assembly with the shaft is automatic and remains so under all normal operating conditions.

Randall Pillow Blocks are compact, completely assembled units —supplied ready for installation. They are economical with their initial low cost plus quicker, easier installation.

The pillow blocks illustrated are representative of the complete Randall line. Randall Pillow Blocks are available for mounting in any position and with a variety of bronze bushings to meet all application requirements. The Randall "DEEP-WELL"® ball assembly, the heart of every Randall Pillow Block, may be purchased separately for use with a housing of your own design. Randall also supplies mounting grommets, safety collars and washers.

Your nearby Randall distributor, working with our engineers, can provide expert help in solving bearing problems. You'll find his name listed in the yellow pages of the telephone directory under "Bearings." Call him today.

RANDALL GRAPHITE BEARINGS, INC. • LIMA, OHIO

Randall

SINCE 1906

Visit Our Display
Booth 304-06
Memorial Auditorium

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UCON IKE

Brings You a New, Friendly Refrigerant Service

Ucon Ike is the symbol of the *real* difference between refrigerants—*service!* He's a friendly fellow—Ucon Ike. A fresh new idea in service. The kind you get with UCON Brand Refrigerants—newest in the industry.

Only UCON Brand Refrigerants, for example, are backed by a written policy that makes doing business easier for wholesalers and contractors. It's a policy that works for you through friendly, competent, energetic people who know and care about your problems, and pledge to distribute only through wholesalers of air conditioning and refrigeration products. Look for Ucon Ike when you want the best in service . . . and top-quality refrigerants.

UCON Refrigerants: 5 top-quality grades; full range of unit sizes; color-coded at the top; personalized service.

UCON Brand Refrigerants are manufactured by
UNION CARBIDE CHEMICALS COMPANY—Division of Union Carbide Corporation
30 East 42nd St., New York 17, N. Y.
Exclusive Sales Agent to Air Conditioning and Refrigeration Wholesalers
ANSUL CHEMICAL COMPANY, Marinette, Wisconsin

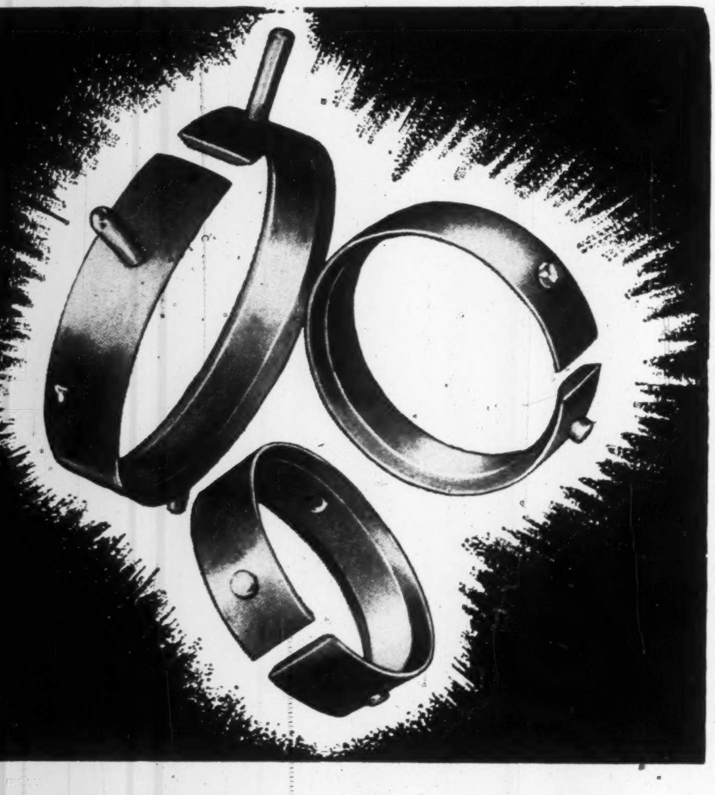
UCON and UNION CARBIDE are registered trade marks of Union Carbide Corporation

a UNION CARBIDE product
Ucon BRAND refrigerants
exclusive sales agent
ANSUL

ROBVON

BACKING RINGS

APPROVED FOR WELDED PIPE, VALVES, AND FITTING JOINTS



- V Nub diameter automatically sets welding for root pass
- V Forms perfect welded joint eliminating slag and icicles
- V Allows complete penetration and fusion
- V Eliminates the necessity of tack welding
- V Radiographs a perfect certified weld

Available in Carbon Steel, Wrought Iron, Chrome Alloys, Stainless Steel, Aluminum and Copper

TYPE CCC Designed for quick easy alignment of pipe where the variation in inside diameters is relatively great. Chamfered NUBS allow close tolerance fit-up and CLEAN STRIKE OFF. The ROBVON NUB conforms to the diameter of weld rod. Robvon rings are beveled to assure non-restricted fluid flow.

TYPE CC Designed to allow quick easy alignment of pipe where the inside diameters are slightly out of round. The welder has the choice of "STRIKING OFF" the NUBS or leaving them intact to be melted into the weld mass of the first root pass.

TYPE C Designed for precise tolerance fit-up. Type "C" NUBS conform to the diameter of the weld root. The NUBS melt with the metal to give complete penetration and fusion.

WRITE FOR FULL INFORMATION

ROBVON ALSO MANUFACTURES MACHINED RINGS TO CUSTOMER'S SPECIFICATIONS. ALL FABRICATED SOLID MACHINED RINGS X-RAYED.

ROBVON
BACKING RING COMPANY

675 Garden Street **Elizabeth, N. J.**

Trane announces *major advances* in air conditioning, heating and ventilating equipment

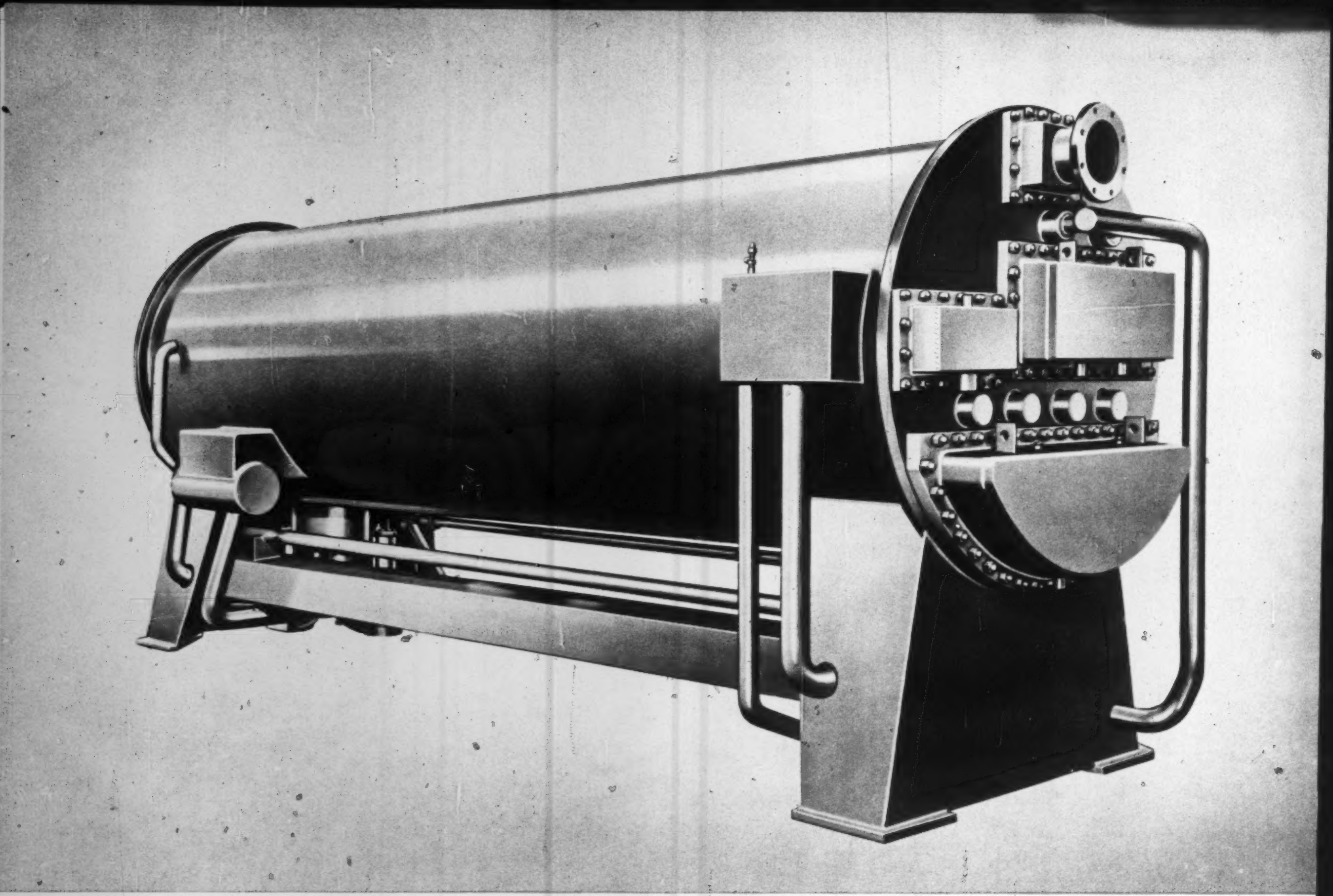
TRANE Research and Testing Laboratory—"The House of Weather Magic"—one of the world's largest laboratories devoted exclusively to heat exchange problems. Here you find temperatures as low as minus 65 F. or as high as 2,500 F. 60 MPH gales in test tunnels; rooms-within-rooms for special critical testing. These show the extent to which TRANE Engineers probe in their concentrated search for new and better ways to improve human comfort and industrial processes through the science of heat transfer.

From "The House of Weather Magic," comes a group of new products designed to meet more application problems in the fields of air conditioning, heating and ventilating. TRANE engineering and research have played an indispensable part in the introduction of this new equipment. Exhaustive testing and analysis assure you that it will meet the highest standards of performance . . . that it is presented to you with accurate ratings.

Here are these latest developments from "The House of Weather Magic"—

- **Fully hermetic packaged absorption water chiller,** for comfort or process applications wherever steam or hot water is available.
- **New hermetic reciprocating water chiller**—with hermetic compressor, chiller and condenser designed and manufactured by TRANE.
- **Hermetic model of the TRANE Reciprocating Compressor** eliminates refrigerant leakage, overcomes motor-compressor alignment problems.
- **A new, compact Unit Ventilator** that provides extra usable space—now available for complete air conditioning, as well as heating and ventilating.
- **Complete new lines of heating and cooling coils** with new header designs, new fin configuration, smaller overall dimensions—and a new, exclusive coil selection method for pinpoint accuracy in less time.
- **New Central Station Air Conditioners** with more sizes, more combinations, for quicker, less costly solutions to a wide variety of application problems.
- **A new, versatile line of industrial fans,** for air and material handling.
- **An all-new, space-saving heat pump** in sizes from 3 through 15 tons.
- **New, smartly-styled, gas-fired Heaters** in propeller, duct and blower types.

For complete information on these latest developments from "The House of Weather Magic," turn the page ⟶



Now—from Trane: the first fully hermetic packaged absorption water chiller!

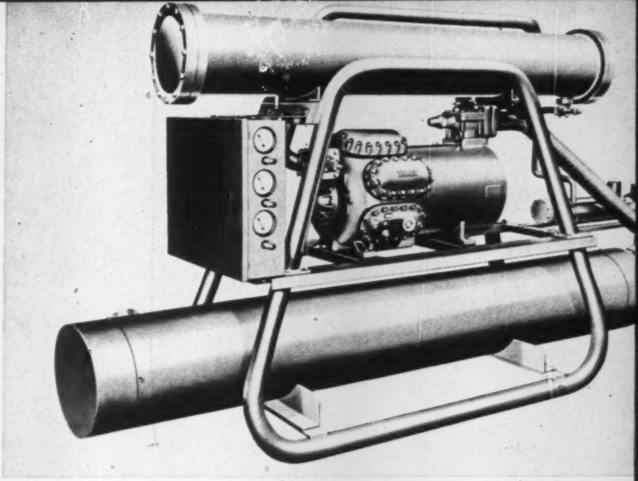
- ***Hermetic design***
- ***Automatic operation***
- ***Single-shell construction***
- ***Factory assembled and wired***
- ***Installation flexibility***
- ***Lower installation and operating costs***
- ***9 sizes—100 to 350 tons***

Here is the industry's first fully *hermetic* absorption type water chiller—the TRANE Absorption Cold Generator. This advanced hermetic design prevents air from entering the system (the chief cause of capacity reduction, crystallization and deterioration).

Compact, lightweight, quiet and vibration-free, the unit may be installed wherever the building structure will support its weight. The machine operates at conditions which avoid crystallization. And it will tend to free itself of any crystallization which could occur through power interruption or other temporarily abnormal conditions.

The TRANE Absorption Cold Generator has single-shell construction that reduces overall size and permits installation in areas with low ceilings. Factory assembled and wired, it has been specially designed to effect substantial savings in installation time and costs. The fully automatic operation means no full-time attendant is needed. Efficient design means less power consumption, economical operation. The new TRANE Absorption Cold Generator can be used for comfort or process in hotels, apartments, office buildings and industrial plants—wherever steam or hot water is available. It is now available in 9 capacities, from 100 to 350 tons.

New Trane Reciprocating Cold Generator now hermetic—with Trane chiller and condenser



Long an industry leader, the new TRANE Reciprocating Cold Generator now is offered with *hermetic* design to provide an even better machine for a wide variety of water chilling applications. It features a new hermetic compressor, new chiller, and a new condenser with a built-in sub-cooler. These major components are arranged to provide a truly compact, efficient water chiller; all three are designed and built by TRANE.

TRANE Reciprocating Cold Generators are small enough to pass through a standard 36″-wide commercial door. Designed for R-22 and R-12—11 sizes, from 10 to 100 tons. All units are available with either pneumatic or electric controls. Factory-wired control panels are mounted on unit, eliminate on-the-job wiring. Compressor-chiller units are available for use with remote evaporative or air-cooled condensers.

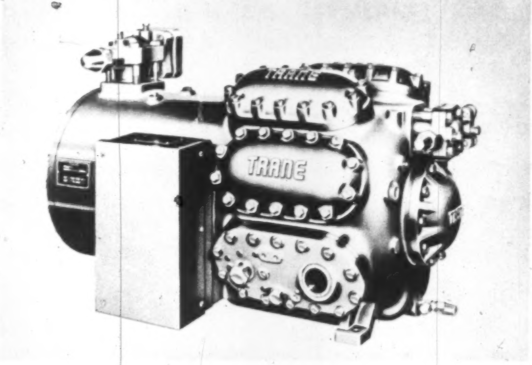
Now! A hermetic model of the Trane Reciprocating Compressor

- ***Designed for R-22 and R-12***
- ***Single-housing construction***
- ***Multi-step capacity control***
- ***Exclusive internal thermal protector***

The TRANE E and F Open Compressor, introduced in 1959 and proven by extensive field testing, is now also offered in a new *hermetic* design. This unit is designed for the more rigorous demands of R-22; it is not a converted R-12 machine. It does, however, perform efficiently at the lower pressures of R-12.

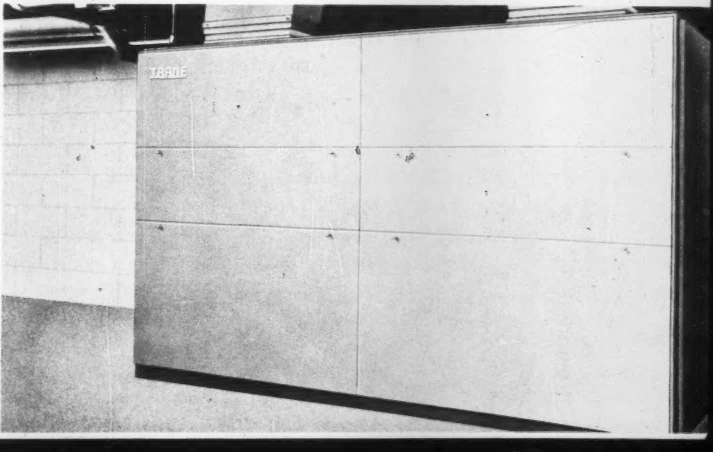
The unit is of single-housing construction. Motor and compressor are in one shell, with a bolted end cover for easy access. This minimizes alignment problems possible with other hermetic compressors that have two-part housing (motor section and compressor section) bolted together. It eliminates adjustment and realignment call-backs often required on open type compressors.

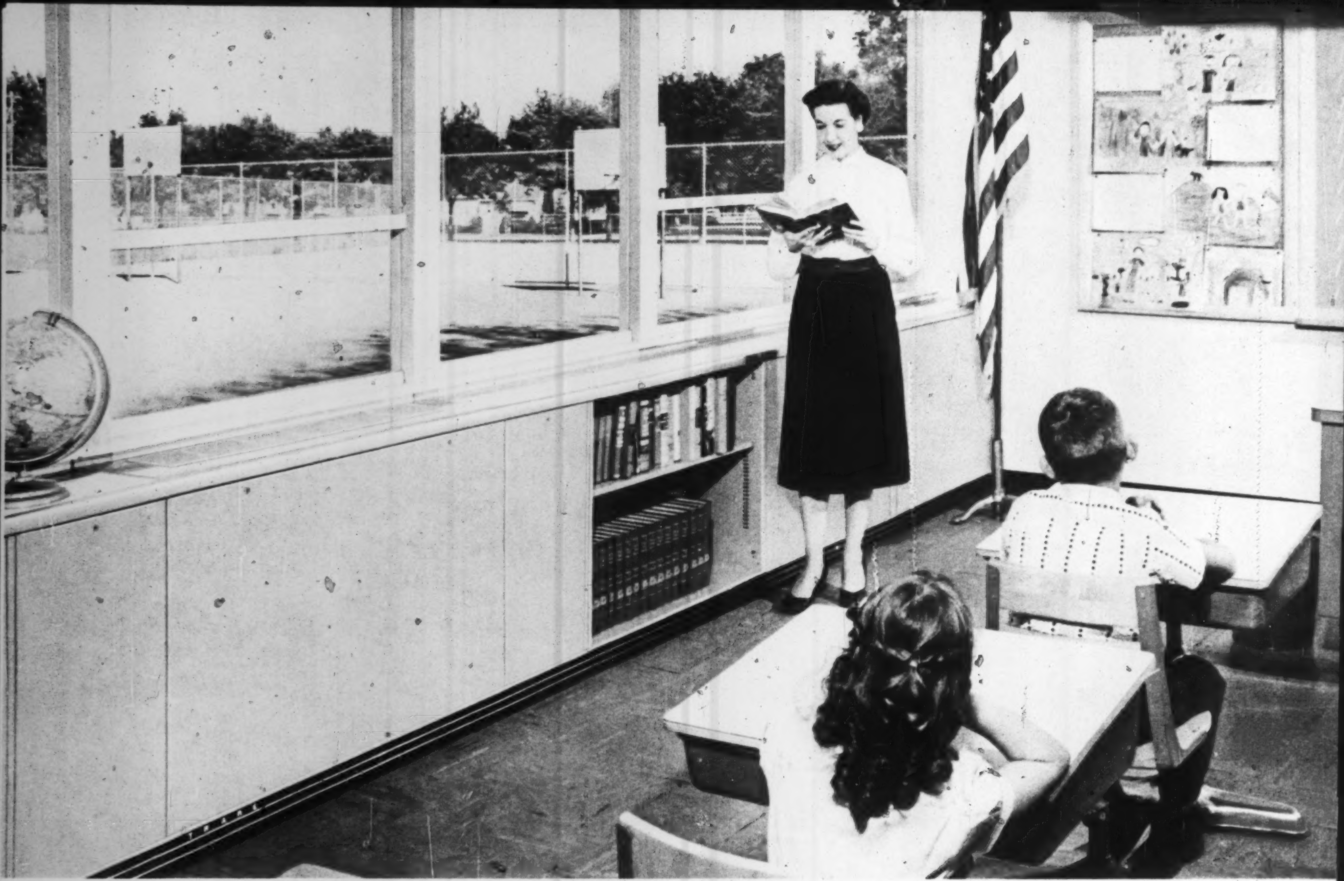
An exclusive internal thermal protector, located in the motor windings, protects against any condition that causes high motor temperatures. Multi-step capacity control reduces starting, stopping, saves power, adds years of life to the unit. Available in capacities from 10 to 100 tons.



True hermetic design eliminates crankshaft seal and coupling; means quiet operation, simplified installation. Large suction chamber and cylinder head safety springs provide slugging protection.

Trane Commercial Self-Contained Air Conditioners feature the new TRANE Hermetic Compressor. Quiet, compact units provide maximum cooling comfort for commercial and industrial applications. Air or water-cooled models in capacities from 10 to 50 tons. Designed for easy installation within or outside of the conditioned space.





New space-saving design! Units are only 11⅝″ deep; heating units 21% thinner, heating-cooling units 29% thinner than other units available. Modern design blends components into a continuous unit. Top surface covered with patterned hard-top material. Units constructed of 14 gauge steel; shelving, 16 gauge.

New Trane Unit Ventilator...now available with air conditioning!

Versatile schoolroom units now heat, ventilate and cool; space-saving design provides more usable classroom space.

Now there's a TRANE Unit Ventilator system to meet the requirements of any climate, any school. These versatile units are now available with air conditioning, as well as heating and ventilating. The refrigeration may be included when the system is installed—or added later. The units can be equipped so future cooling requires only the addition of a source of chilled water. No additional piping to the unit is necessary.

Now only 11⅝″ deep, TRANE Unit Ventilators give you extra, usable classroom space. And the same space-saving cabinet design is used for all types of units—hot water, steam, chilled water and electricity.

The TRANE *Kinetic Barrier* action provides wall-to-wall, *powered* air distribution (for heating, ventilating and air conditioning) through continuous outlets below the windows. This exclusive TRANE feature means ideal classroom comfort, all day long.

For your next school job, make it a TRANE Unit Ventilator system to save valuable floor space, to reduce installation and operating costs—while providing the ideal schoolroom climate.

FIVE VERSATILE SYSTEMS

Versatile TRANE Unit Ventilators give you just the type of system you want. And all types use the same cabinet styling. All units available in 28″—as well as 32″ height.

1. **Air Conditioning**—heating, ventilating and cooling—by-pass control—hot water and chilled water.
2. **Heating and ventilating**—valve control—steam or hot water.
3. **Heating and ventilating**—by-pass control—suitable for all climates—hot water only.
4. **Heating and ventilating**—by-pass control—suitable for mild climates—hot water only.
5. **Heating and ventilating**—electric resistance heating element—step control.

Complete new lines of all types of heating and cooling coils

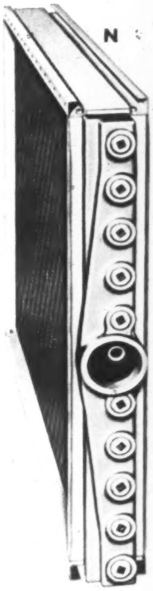
New casing, new headers, new fin, new tube arrangement provide these outstanding features:

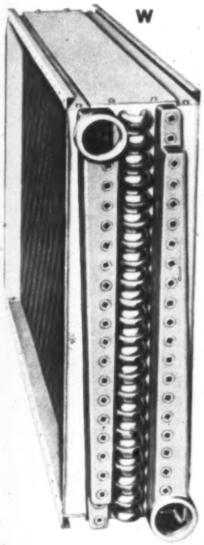
- ***Compactness***
- ***No air by-pass***
- ***A truly drainable coil***
- ***Non-freeze coil design with 1-inch tubes to provide optimum temperature distribution***
- ***Rugged cast-iron headers result in lower water pressure drop***
- ***A truly cleanable coil***

Here is the all-new line of TRANE Heating and Cooling Coils with major design improvements that will provide maximum efficiency, and fast, easy maintenance.

The new TRANE Sigma-Flo Fin design increases heat transfer efficiency. A new casing design reduces overall dimensions, eliminates air by-passing the coil, minimizes moisture carry-over on dehumidifying coil.

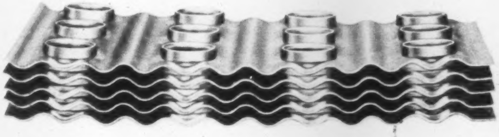
The new cooling coil line features an all-purpose coil, a completely drainable coil, a completely cleanable coil and a direct expansion coil. New heating coils feature a non-freeze design with one-inch O.D. tubes as standard, to provide optimum temperature distribution across the face of the coil. This is a "premium" coil at a standard price.





Type N coil, non-freeze design, with one-inch O.D. tubes that provide uniform temperature distribution across coil face. Positive freeze protection.

Type W all-purpose water cooling coil, from return end. Rugged cast-iron headers provide most efficient flow distribution. Cover is removable for easy field maintenance.



Vertical cross-section of cooling coil Sigma-Flo Fin. Wavy design increases turbulence, improves heat transfer efficiency, results in more compact design.

Now! A new cooling coil selection method from Trane that assures pinpoint accuracy, cuts selection time!*

The TRANE Company presents an altogether new selection method for cooling coils that is simple, quick, easy to use—and highly accurate. It provides coil selection accuracy over a wide range of conditions—based upon theory and correlations that have been developed by exhaustive test programs.

The TRANE coil selection method is more accurate than present practices because (1) it takes into account the effect of fin efficiency and surface temperature for wetted surface conditions. (2) It provides an accurate mass heat transfer factor under wetted surface conditions. (3) Heat transfer potential is based on *wet bulb temperatures.*

With this exclusive TRANE development, greater accuracy will be assured through easy-to-use charts plotted from electronically computed data. For complete information on how you can use this new method in your work, just call your nearby TRANE Sales Office.

*Pat. applied for.

New Trane Central Station Air Conditioners solve more air-handling problems

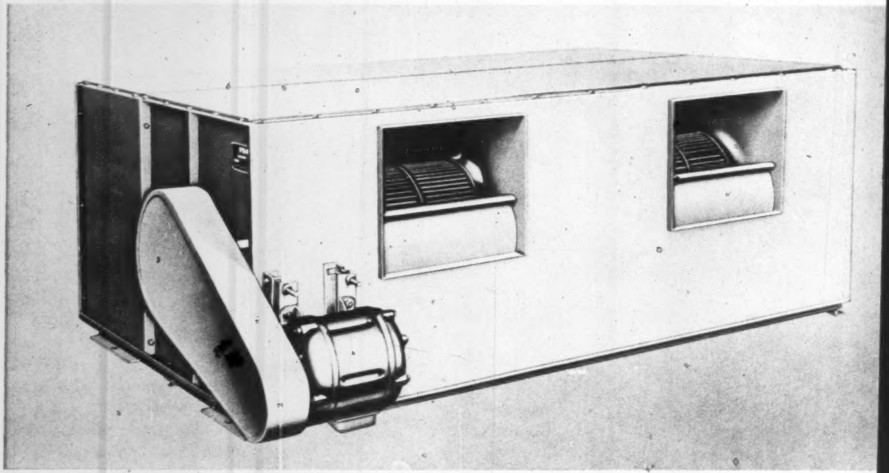
Draw-through and Multi-Zone, low and medium-pressure units provide overall versatility and flexibility

The new TRANE Climate Changers give you more sizes, more combinations, for quicker, less costly solutions to a wider variety of application problems.

There are more sizes, to give you just the capacity you need for a given application. The units are smaller, more compact, to solve difficult installation problems.

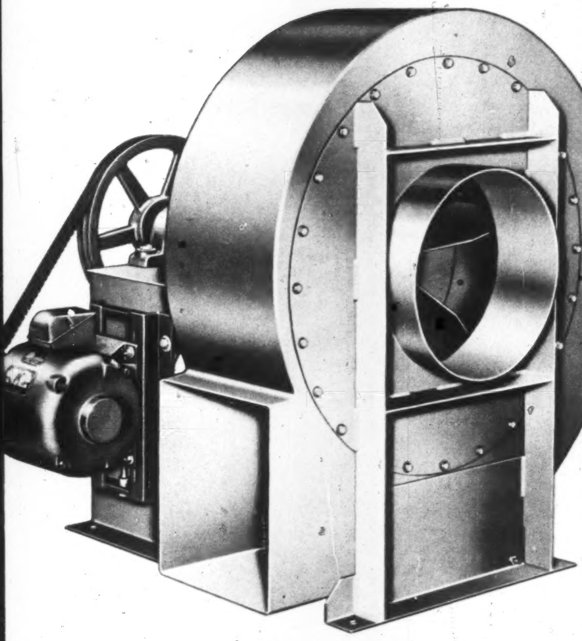
The Climate Changer fan assembly is electronically balanced before shipment to minimize installation and maintenance problems. The entire unit is tested at the factory—*as a unit*—just as it will be installed on the job.

Regardless of the application problem, Climate Changer units can be selected, step-by-step, to meet the individual job requirements. There are draw-through and Multi-Zone models available in low and medium-pressure types, in a wide range of capacities from 1,200 to 47,000 cfm.

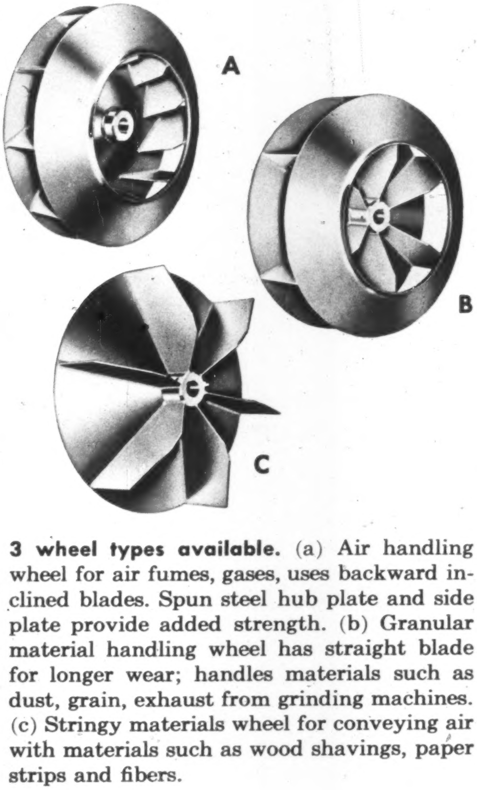


Check these advanced Climate Changer features:

- **More compact**—dimensions drastically reduced.
- **More sizes available**—14 sizes, from 3 to 63 sq. ft. coil area.
- **Carefully rated**—tested as a unit; complete fan assembly electronically balanced before shipment.
- **Improved damper design**—mixing box design eliminates stratification; opposed blade dampers for better control.
- **Improved casing design**—1″ insulation prevents sweating panels; full-length drain pan under fan and coil protects against water carry-over; pitched coils for complete drainability; coils located to minimize wiping.
- **New coil design**—one-inch O.D. tube non-freeze coil (exclusive with TRANE); completely drainable coils available; new Sigma-Flo Fin design for increased efficiency.
- **Multi-Zone units**—provide independent and variable control for up to 14 zones; damper section permits maximum flexibility in zone selection.
- **New coil selection method**—exclusive with TRANE; assures pinpoint accuracy in less time! (*see page 5*).



One standard housing design is used for all wheel types on the new TRANE Industrial Fans. Housing is fully convertible, designed for easy installation.



3 wheel types available. (a) Air handling wheel for air fumes, gases, uses backward inclined blades. Spun steel hub plate and side plate provide added strength. (b) Granular material handling wheel has straight blade for longer wear; handles materials such as dust, grain, exhaust from grinding machines. (c) Stringy materials wheel for conveying air with materials such as wood shavings, paper strips and fibers.

New Trane Industrial Fans are versatile, sturdy, economical to operate

Three basic wheel types solve a wide variety of air and material handling problems

Here is a modern fan line with the latest advancements for industrial applications—from TRANE, a leading manufacturer of fans engineered for comfort and process.

These new TRANE Industrial Fans are designed and built to exacting specifications . . . tailored to the job requirements. They're rugged; they're versatile; in all the AMCA established standard wheel sizes from 19⅛ in. to 64⅜ in.

TRANE Industrial Fans have been designed to handle air, fumes, gases and materials in a wide variety of industrial applications: exhausting from pickling tanks, grinders, and woodworking equipment; for pneumatic conveyance of materials such as cast iron borings, sand, cement, salt, grain, paper, wood chips, powdered coal, dry cotton and wool—and many others. They are also designed for high temperature applications. Engineered for efficient, quiet operation, the fans are designed for low power consumption.

Here's how Trane Industrial Fans are designed for the toughest industrial jobs:

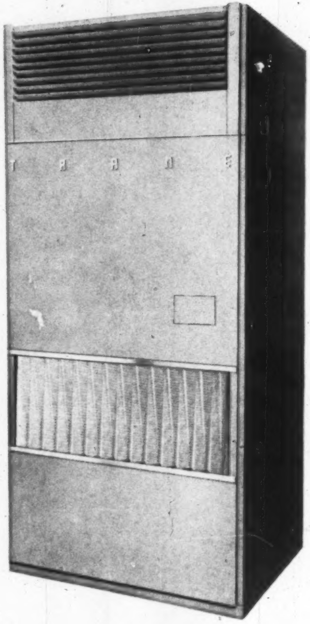
- **High mechanical efficiency**—Smooth, efficient operation cuts power costs to a minimum, keeps noise level down. Blade design prevents trapping of material. Formed inlet design directs the air into wheel, minimizes turbulence. Shape, width, number of blades laboratory-tested to assure optimum results.

- **Sturdy construction**—Fan shafts are machined to close tolerances. Heavy-duty ball bearings are used. Tight tolerances between fan wheel and shaft prevent loosening and imbalance. Standard housing for all wheel types is arc-welded. Easily accessible mounting bolts simplify installation. Housings have both vertical and horizontal angle-iron bracing for extra strength. All parts phosphatized before painting.

- **Versatility**—Available in a full range of capacities for a wide variety of uses. Optional accessories include cooling wheels for bearings, shaft seals, dampers, corrosion-resistant coatings, corrosion-resistant metals.

Trane announces:

A compact, efficient heat pump—in sizes from 3 to 15 tons—for domestic, industrial and commercial jobs



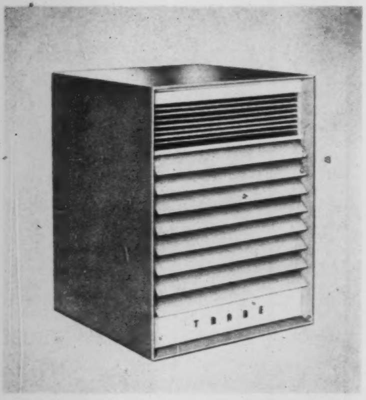
This new TRANE Heat Pump broadens the famous TRANE line of packaged Deluxe Self-Contained Climate Changers for homes, stores, offices and factories. Compact, modern, it is designed for in-the-room or remote installation.

The TRANE water-to-air Heat Pump is easy to install. Water piping and connections are easily accessible. Fans can be rotated in the field to change air discharge direction. Features new TRANE Sigma-Flo Fin Coil for greater efficiency in less space.

TRANE HEAT PUMP FEATURES:

- **Easy to install!**—Easily accessible piping and connections. Completely factory-wired. Fans easily rotated in the field.
- **Full-rated capacity**—Matched components are laboratory-tested to assure peak performance, maximum efficiency.
- **Pre-wired controls**—Automatic thermostatic control change-over from heating to cooling available.
- **Compact cabinet**—Attractive, baked enamel finished cabinet takes little floor space. All components mounted on steel frame to prevent vibration. Cabinet design provides easy access for service and maintenance.
- **Removable refrigeration cycle**—for easy maintenance, service.
- **5 sizes**—3, 5, 7½, 10 and 15-ton units.

Now! Propeller, duct and blower gas-fired Trane Heaters with crisp, compact design!



The new TRANE gas-fired Heater is available in 3 basic types: *Propeller*, using the new TRANE Fan. Used without ducts, within area to be heated. *Blower type* uses a centrifugal fan, for duct or free air delivery. *Duct heater* for separate fan systems; ideal for use with TRANE Self-Contained Air Conditioners.

This new TRANE gas-fired Heater is smartly styled to look "at home" in any surroundings. Its compact, efficient design reduces weight and makes it easy to install in minimum space. An aluminized, all-welded heat exchanger assures trouble-free operation, long life. The steel, ribbon-type burners have stainless steel inserts.

An exclusive TRANE Control Package provides on-off-automatic thermostat, low limit switch, high limit switch. Optional 2-speed unit has switch to control motor and two-stage valve. Motor speed and gas input are balanced for maximum efficiency, economy, comfort. Complete range of capacities from 25,000 to 250,000 Btu.

TRANE GAS-FIRED HEATER FEATURES:

- **Attractive, compact styling**—Efficient design reduces weight, means more Btu's/pound, lower shipping and installation costs.
- **Exclusive Louver Fin Diffuser**—Performance proven on famous TRANE Model H Unit Heaters; steers heat for pinpoint comfort, gives lateral control.
- **TRANE-made Propeller Fan**—Designed exclusively for unit heaters. Aluminum construction; quiet, efficient operation.
- **Versatile**—Complete range of capacities from 25,000 to 250,000 Btu. Three types: Propeller, Blower, Duct.

For any air condition, turn to

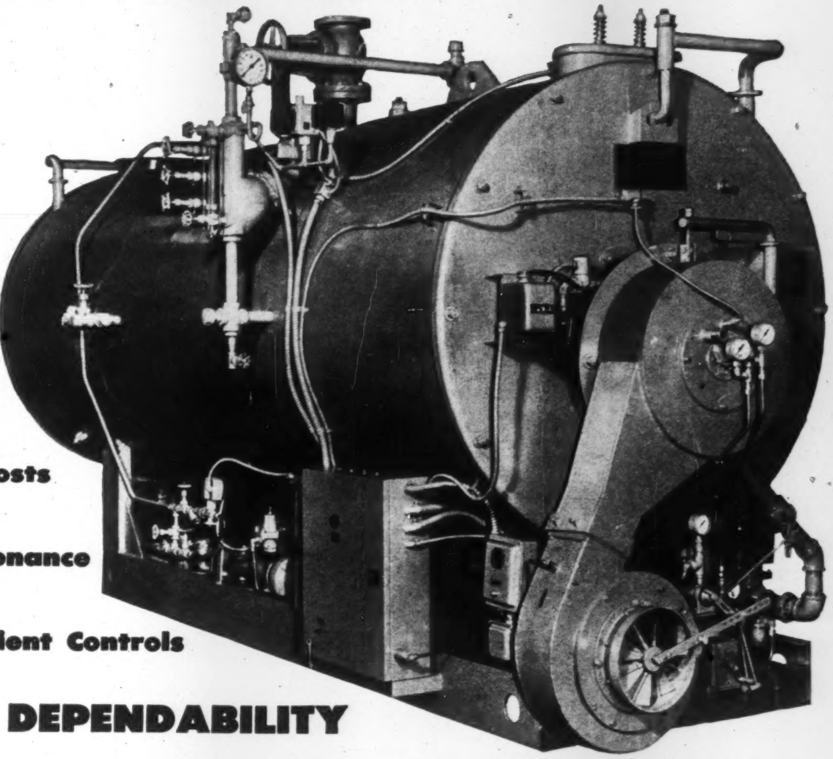
TRANE

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

THE TRANE COMPANY, LA CROSSE, WIS. • SCRANTON MFG. DIV., SCRANTON, PA. • CLARKSVILLE MFG. DIV., CLARKSVILLE, TENN. • TRANE COMPANY OF CANADA, LIMITED, TORONTO • 100 U.S. AND 19 CANADIAN OFFICES

NEW AMESTEAM GENERATOR

MODEL AA



NEW **Lower Cost**

NEW **Oil Burner**

NEW **Gas Burner**

NEW **Compactness**

NEW **Lower Fuel Costs**

NEW **Lower Maintenance Costs**

NEW **More Convenient Controls**

. . . OLD AMES DEPENDABILITY

The **NEW** Model AA AMESTEAM GENERATOR offers the ultimate in steam generating efficiency and reliability.

The **NEW**ly designed low pressure air atomizing oil burner will cleanly and uniformly burn all commercial grades of oil — #4 with little or no preheat — for more efficient, economical firing. Since electric pumping and preheat loads are lower, power costs are greatly reduced. For gas firing the **NEW** ring type burner provides a more uniform flame pattern for cleaner, more efficient combustion.

All Model AA AMESTEAM GENERATORS are designed to operate at top efficiency over a modulation range of 20% to 100% of rating.

The Model AA incorporates Ames' time-proven 3-pass concentric tube design, single one-piece baffle and one-piece flue covers. Easier access is provided for inspection and servicing. The **NEW** ultra-compact design simplifies positioning and installation. All units are factory-assembled and fire-tested.

Before you buy a package boiler get the facts on the all **NEW** Model AA AMESTEAM GENERATOR.

AMES **IRON WORKS, INC.**
OSWEGO, NEW YORK

AMES IRON WORKS, INC., Box D-10, Oswego, N. Y.

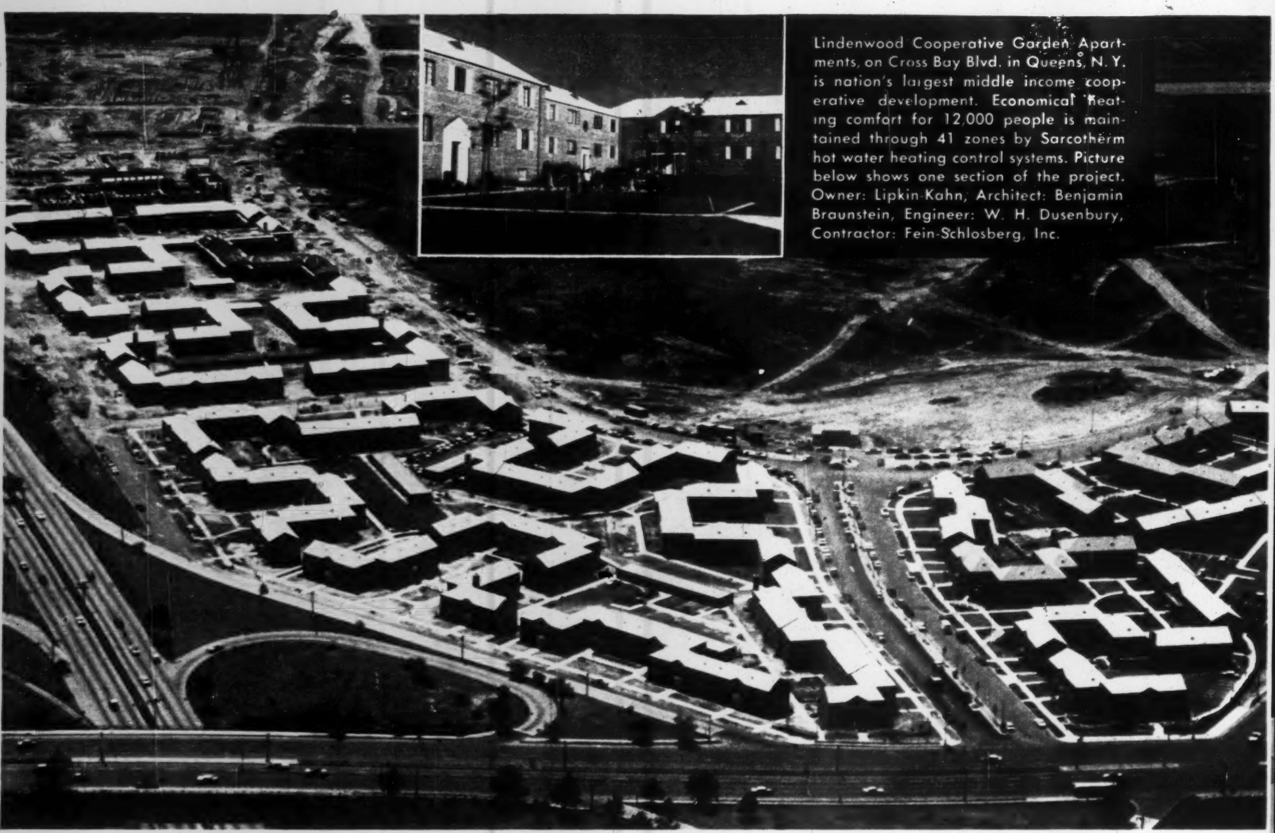
Please send me full details on the **NEW** AMESTEAM GENERATOR Model AA Package Boiler.

NAME & TITLE____________________

COMPANY____________________

ADDRESS____________________

CITY__________ZONE_____STATE________



Lindenwood Cooperative Garden Apartments, on Cross Bay Blvd. in Queens, N. Y. is nation's largest middle income cooperative development. Economical heating comfort for 12,000 people is maintained through 41 zones by Sarcotherm hot water heating control systems. Picture below shows one section of the project. Owner: Lipkin-Kahn, Architect: Benjamin Braunstein, Engineer: W. H. Dusenbury, Contractor: Fein-Schlosberg, Inc.

$40,000,000 PROJECT MAINTAINS EVEN, ECONOMICAL HOT WATER HEATING WITH SARCOTHERM CONTROL SYSTEM

The Sarcotherm Weather Compensated heating control system installed at the new Lindenwood Cooperative Garden Apartments in Queens, New York, assures its residents even, reliable heat regardless of outdoor temperature. The engineer, William Dusenbury, worked out with Sarcotherm specialists a system that provides for continuous, modulated hot water flow. This system also handles night setback and morning pickup automatically, requiring no supervision.

An outdoor bulb, sensitive to change in outdoor temperature, controls a 3-way mixing valve, which regulates the temperature of the hot water supply to the system, in accordance with outdoor temperature changes. For example, at an outside temperature of 0°F., heating water is delivered at 200°F. An outdoor temperature of 65°F. sets the *water* control for 110°F. When the outside temperature exceeds 65°F., the Sarcotherm BA-4C High Limit Pump Control shuts off the heating system automatically. The PBA-2 program panel, especially designed by Sarcotherm engineers for apartment control, provides automatic heat programming. Comfortable, even heating is maintained in all 41 zones in the group of apartments.

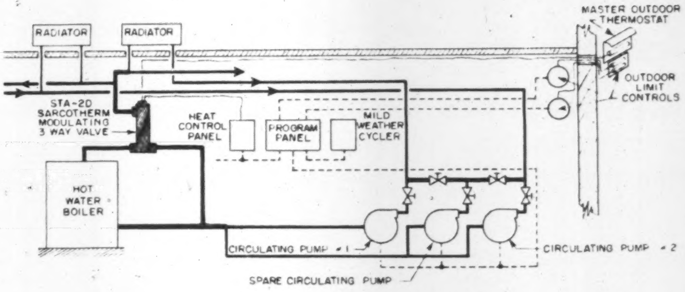
The entire installation of the control system was supervised by Sarcotherm Controls, Inc.

Write for Sarcotherm Technical Literature. Please specify steam or hot water.

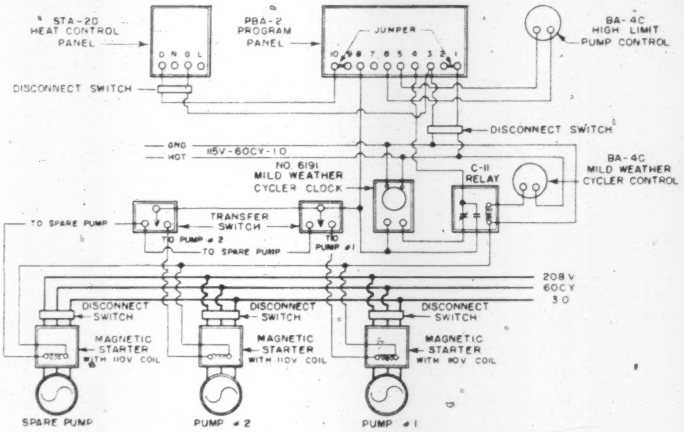
SARCOTHERM CONTROLS

Sarcotherm Controls, Inc., an affiliate of Sarco Company, Inc.

635 Madison Avenue, New York 22, N. Y. • Plant: Bethlehem, Pa.


RADIATOR
RADIATOR
MASTER OUTDOOR THERMOSTAT
OUTDOOR LIMIT CONTROLS
STA-2D SARCOTHERM MODULATING 3 WAY VALVE
HEAT CONTROL PANEL
PROGRAM PANEL
MILD WEATHER CYCLER
HOT WATER BOILER
CIRCULATING PUMP # 1
CIRCULATING PUMP # 2
SPARE CIRCULATING PUMP

Schematic hook-up of Outdoor-Indoor Sarcotherm Control System


STA-2D HEAT CONTROL PANEL
D N G L
PBA-2 PROGRAM PANEL
JUMPER
10 9 8 7 6 5 4 3 2 1
BA-4C HIGH LIMIT PUMP CONTROL
DISCONNECT SWITCH
DISCONNECT SWITCH
GND
HOT
115V-60CY-1Ø
NO. 6191 MILD WEATHER CYCLER CLOCK
C-11 RELAY
BA-4C MILD WEATHER CYCLER CONTROL
TO SPARE PUMP
TRANSFER SWITCH
TO PUMP # 2
TO SPARE PUMP
TO PUMP # 1
208 V
60CY
3 Ø
DISCONNECT SWITCH
DISCONNECT SWITCH
DISCONNECT SWITCH
MAGNETIC STARTER WITH 110V COIL
MAGNETIC STARTER WITH 110V COIL
MAGNETIC STARTER WITH 110V COIL
SPARE PUMP
PUMP # 2
PUMP # 1

Schematic wiring diagram for Sarcotherm Control System

. . . AND THESE SIMPLE, ACCURATE, AND RUGGED SARCOTHERM CONTROLS WERE EASY TO INSTALL . . . EASY TO MAINTAIN

Sarcotherm unit-packed and tagged every component and keyed all parts to installation diagrams and blueprints — substantially reducing installation time. On-the-job supervision by trained Sarcotherm personnel added materially to the efficiency of the job.

After installation, another Sarcotherm standard policy helped to make field adjustments easy. Sarcotherm provided complete operating and adjusting instructions, both verbal and written, to maintenance personnel.

Lindenwood now has a virtually maintenance-free control system. This project is profiting from the soundness of Sarcotherm design and operating methods developed through two decades of specialized experience. 1792

* *FOR COMPLETE CONTROL SYSTEM CATALOG* write Sarcotherm Controls, Inc., 635 Madison Ave., New York 22, N. Y.

SARCOTHERM CONTROLS

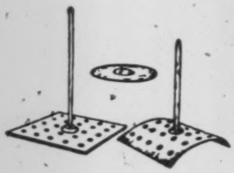
Sarcotherm Controls, Inc., an affiliate of Sarco Company, Inc.
635 Madison Avenue, New York 22, N. Y. • Plant: Bethlehem, Pa.

For Economical Installation
Use Miracle Surface Anchors and Miracle Adhesives

■ adhesive applied Miracle Surface Anchors

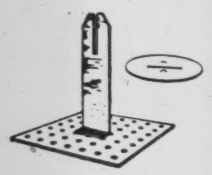
Miracle Surface Anchors provide firm, positive support for block, fibrous glass, and board types of insulation, furring strips, wood sills and headers, conduits, pipes, fixtures, etc., on all types of clean, rigid structural surfaces. These clips also provide anchorage in otherwise inaccessible locations. Miracle Surface Anchors consist of perforated metal plates 2″ x 2″ or 2¾″ x 2¾″ to the center of which is welded a spindle, prong, nail, bolt or threaded stud; selection depends upon the material and load to be supported. The perforated base is designed to provide anchorage by bonding it to masonry, metals, plaster, tile, glass, etc., with Miracle Anchor Adhesives which are manufactured in various formulations to meet job requirements. Consult your local Miracle representative for details covering any special installation.

description



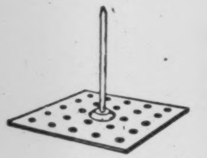
Spindle Anchor and Washer

For bonding cork, fibrous glass batts, thermal cellular glass, mineral wool, etc., to ducts, walls and ceilings.



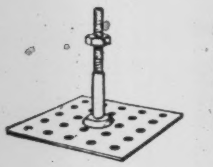
Pronged Anchor and Washer

For bonding block insulation such as thermal cellular glass to ducts, walls and ceilings. Pronged Anchors are set between rows of block insulation and prongs bent in reverse direction over blocks.



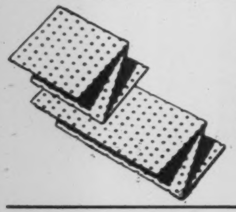
Anchor Nail

For bonding furring strips to masonry walls for the attachment of wallboard.



Anchor Bolt

For attaching cabinets, towel, tissue and other types of dispensers to tile or other rigid surfaces.



Z Clip

A self furring clip for attaching wallboard, plasterboard, insulation board, etc. to exterior walls when an air space is required.

■ direct adhesion

The following list of adhesives, sealers, and coatings has been developed for both on-the-job and production line applications. They may be applied by trowel, brush, spray and roller-coating.

type M	For bonding corkboard to submarine and ship hulls. Meets U.S. Navy Spec. MIL-A-18065
type AA	Anchor Adhesive for bonding Miracle Surface Anchors to metal or masonry walls, ducts, etc. Service temperature range −30° to +180°F.
HT 4620	Anchor Adhesive for bonding Miracle Surface Anchors on overhead installations and where heat resistance higher than AA is required. Service temperature range −30° to +225°F.
ER 475	2 part Anchor Adhesive for bonding Miracle Surface Anchors where highest heat resistance is required. Service temperature range −30° to +325°F.
PF 42	For bonding low density fibrous glass, sheet cork, Asphalt impregnated pads, mineral wool, aluminum foil—also for bonding woven asbestos cloth to ducts and blanket type lightweight insulation in metal buildings
PF 52	For bonding low density fibrous glass, mineral wool, vapor barrier paper—longer open time than PF 42
PF 62	For bonding blanket type fibrous glass to metal ducts and surfaces —high heat resistant
PF 78	General purpose high heat resistant adhesive for bonding fibrous glass.
PF 122	For bonding medium density fibrous glass and corkboard to metal, wood, masonry, also as sound deadener for sheet metal
PF 232	For bonding high density fibrous glass, wool batts, sheet-cork. Non-flammable emulsion type adhesive
MF 22	For bonding fiberboard, corkboard, expanded plastic insulating materials, etc. to any structurally sound surface. Also for insulation and vapor barrier materials to metal or concrete roof decks.
LT 153	For bonding fiberboard, corkboard, etc. to metal or masonry in cold room applications. Low cold test
PS 82	For bonding expanded plastic foam type insulation. Approved by Dow Chemical Co. for bonding Styrofoam.
RT 1000	Two part rubber latex type adhesive used for bonding Styrofoam insulation. Approved by Dow Chemical Co.
FO 409	Cold Setting mastic to replace hot asphalt mopping on the back of cellular glass insulation when placed in ceiling forms with Miracle Surface Anchors before pouring concrete.
ER 428	Epoxy Resin 2 part material for bonding aluminum honeycomb to glass, metal, asbestos board, etc.
CA 30	Contact Type Adhesive for bonding paper honeycomb to glass, metals, asbestos board, etc.
CA 40	Coaltar epoxy combination for sandwich panel construction.
L 2000	For laminating foil, vinyl, asphalt impregnated paper to low density fibrous glass.
FO 400	Flexible sealer for setting cellular glass.

Miracle coatings and sealers for insulation

primer	For priming metal or masonry surfaces also as a vaporseal and/or waterproofing coat
SF 313	Vapor barrier coating for molded fibrous glass—also adds to structural strength.
SF 466	On-the-job sealer to bond white wrap-around vapor barrier paper on molded fibrous glass pipe insulation
SF 209	On-the-job sealer to bond black wrap-around vapor barrier paper on molded fibrous glass pipe insulation
NP 555	Joint sealer for high velocity ducts
NP 617	Joint sealer for high velocity ducts.

MIRACLE ADHESIVES CORPORATION

250 PETTIT AVENUE
BELLMORE, LONG ISLAND, N. Y.

IT MAKES SENSE !

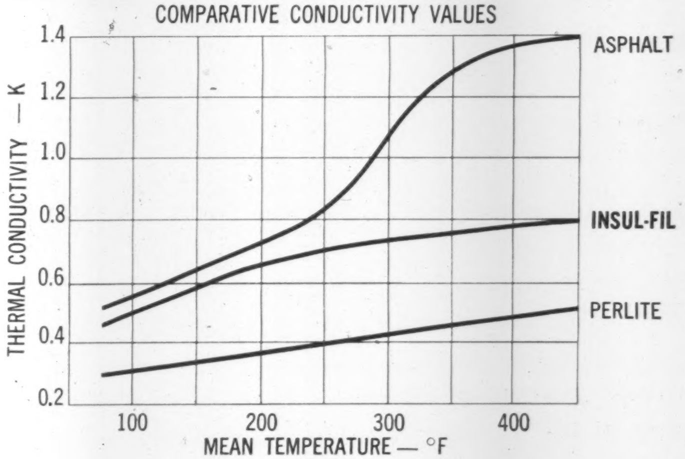
TO INSULATE UNDERGROUND PIPING WITH

insul-fil®

1 Introduction of a material such as expanded perlite into a granulated hard asphalt improves the insulating value of the blend.

2 Proper selection of asphalts by softening point to make up asphalt-perlite blends improves the insulating properties of the blend.

3 Introduction of an aggregate, such as perlite, into a granulated asphalt improves the mechanical properties of the blend once it is plasticized.



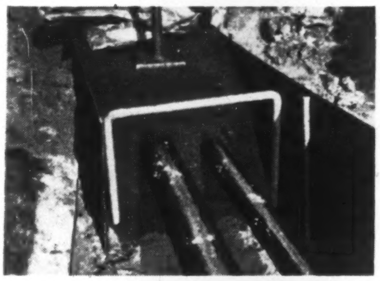
After years of extensive testing conducted at the Research and Development Department of The Atlantic Refining Company, these conclusions were presented in a Paper given before the American Chemical Society in Dallas, Texas, April, 1956. Since that time, hundreds of Insul-fil field installations have confirmed these conclusions.*

It is a well-known fact that the use of asphalt in construction created the necessity for the introduction of fillers (usually inorganic) of various types for the purpose of arresting the flow characteristics and improving the insulation value of the asphalts themselves.

The blend of hard granular asphalt and asphalt coated perlite gives Insul-fil its excellent insulating properties, water resistance and sufficient structural strength to the insulating body to resist normal soil stresses with the steam on or off.

An important Insul-fil development is the priming of the pipe with Accelerator #7591. The use of accelerator provides continuous adhesion of Insul-fil to the pipe, hastens consolidation, and gives additional protection against corrosion by galvanic action.

**Paper available on request.*



Insul-fil Is Simple To Install
Just pour it around the pipe to be insulated. Prod and tamp it in place and backfill. Heat introduced into the pipe forms the conduit.

Insul-Fil Company Inc.
250 Pettit Avenue
Bellmore, Long Island, N. Y.
Please send literature.

NAME________________________________

COMPANY________________________________

ADDRESS________________________________

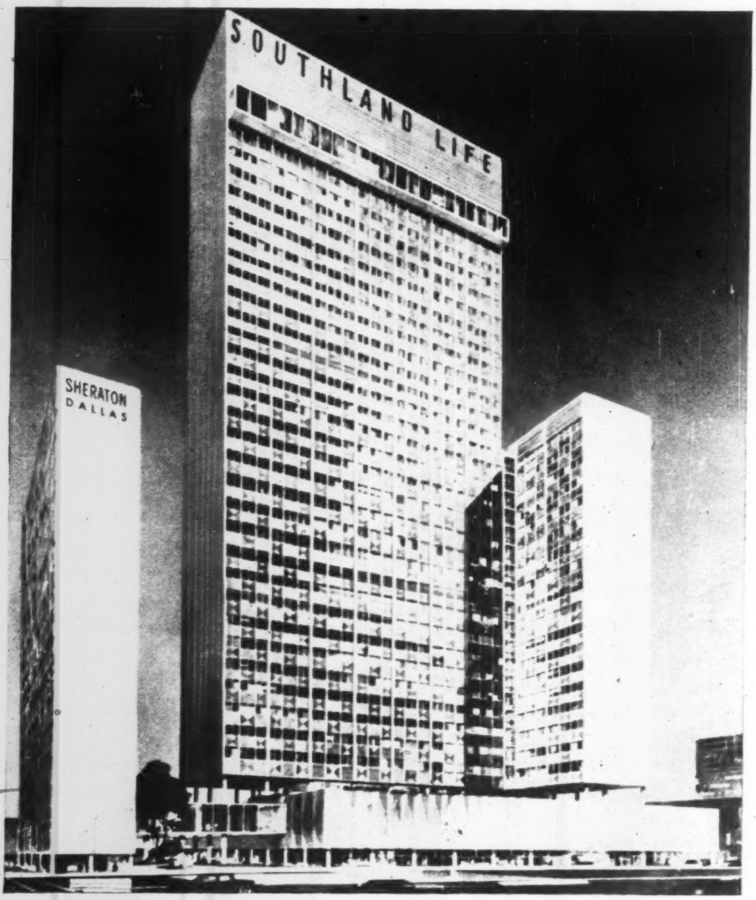
CITY_______________ ZONE_____ STATE________

insul-fil

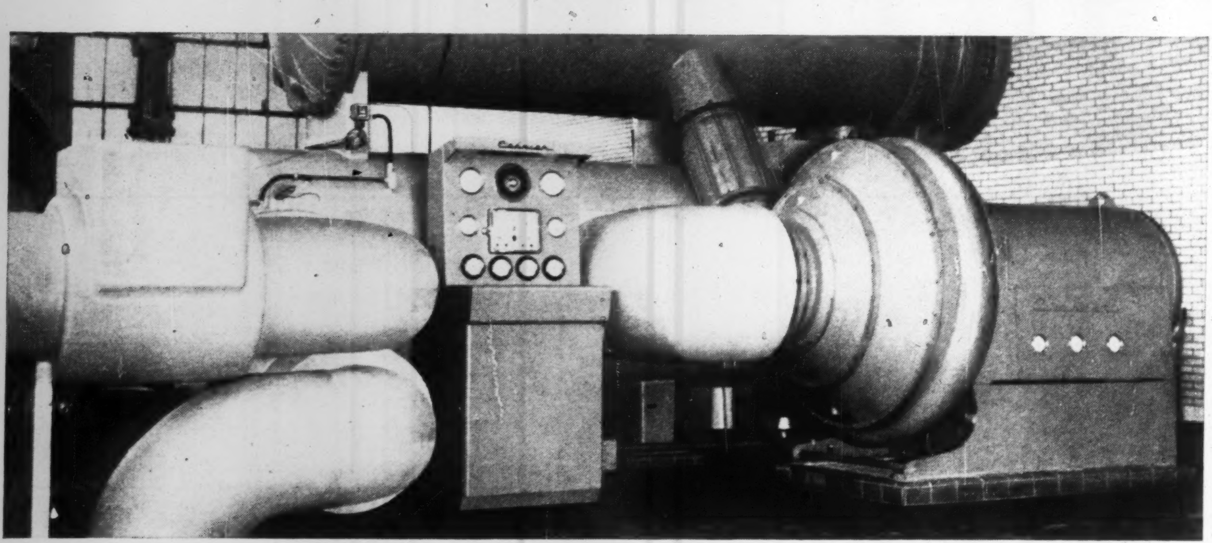
The most efficient Granular Fill Type Insulation for Hot Underground Piping

Insul-Fil Company Inc. DIVISION OF: MIRACLE ADHESIVES CORPORATION, 250 PETTIT AVENUE, BELLMORE, LONG ISLAND, N. Y.

Southwest's Largest Commercial



Architect's drawing of the block-square Southland Center in downtown Dallas. The 3-building complex includes the 42-story home office of Southland Life Insurance Company, the 600-room Sheraton-Dallas Hotel, a shopping area, a 2000-car garage and a 36-story skyscraper to be built at a future date.



A hermetic centrifugal water chilling machine, typical of those built by Carrier Corporation for Southland Center. Southland's air-conditioning system is the world's fifth largest in total capacity for commercial multi-room structures and the biggest yet using this type of equipment.

Air-Conditioning System is Charged with genetron® SUPER-DRY REFRIGERANT

Over 28,000 Pounds of "Genetron" 11 Used For Vast Air-Conditioning Project

Four stories underground—beneath the fabulous new $35 million Southland Center in Dallas, Texas—six 1000-ton centrifugal water chilling machines, built by Carrier Corporation, form the "heart" of the largest air-conditioning system of any commercial building in the entire Southwest. This giant cooling plant supplies enough cold water to cool and dehumidify air in all offices, rooms, shops, even lobbies and public passageways.

The refrigerant used in these special Carrier-built cooling machines is General Chemical's "Genetron" 11—shipped by special tank truck from our Baton Rouge Works in Louisiana. Actual unloading of the refrigerant was accomplished by pipeline from the sidewalk directly to the six units located four floors below in the engine room of the Southland structures. It is believed to be the first time this method of charging refrigeration equipment was ever attempted, and its successful outcome was the result of teamwork between General Chemical's sales and technical service staffs and representatives of Carrier.

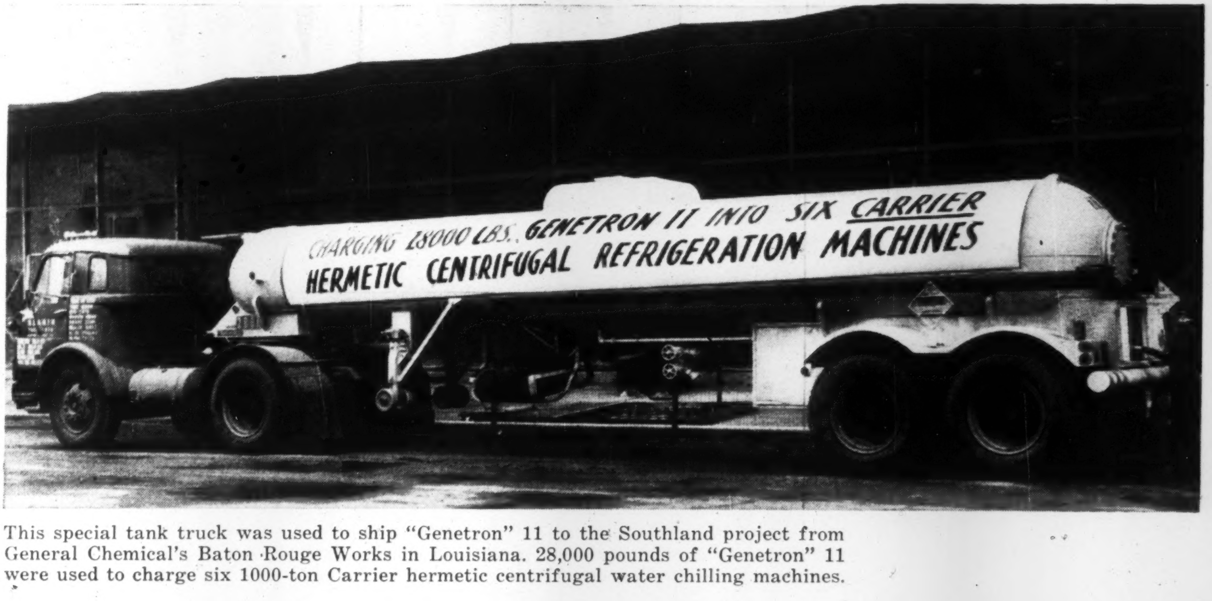
Service like this is typical of the close cooperation and support General Chemical is geared to give its customers . . . and the kind of service always available to *you* whenever you need it.

Service is *one* of the reasons why so many users prefer "Genetron" fluorinated refrigerants. Another is their uniformly high quality. Their moisture content is extremely low and their strict specifications are consistently *bettered* in production. Good reasons for *you* to insist on "Genetron"!

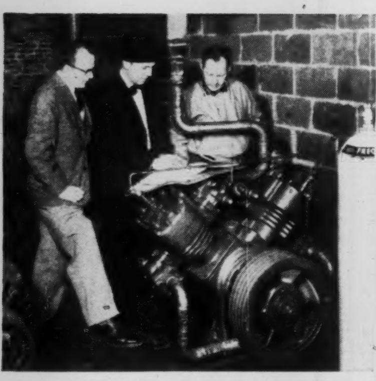
genetron 11 ORANGE LABEL CCl_3F TRICHLOROMONOFLUOROMETHANE
genetron 12 WHITE LABEL CCl_2F_2 DICHLORODIFLUOROMETHANE
genetron 22 GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
genetron 114a BLUE LABEL $C_2Cl_2F_4$ DICHLOROTETRAFLUOROETHANE

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N.Y.

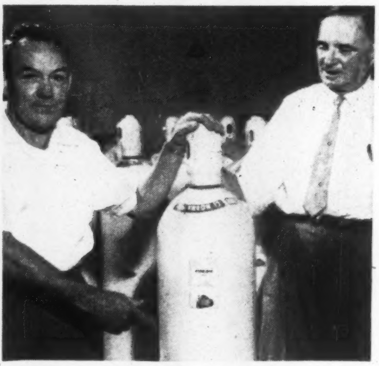

CHARGING 28000 LBS. GENETRON 11 INTO SIX CARRIER
HERMETIC CENTRIFUGAL REFRIGERATION MACHINES

This special tank truck was used to ship "Genetron" 11 to the Southland project from General Chemical's Baton Rouge Works in Louisiana. 28,000 pounds of "Genetron" 11 were used to charge six 1000-ton Carrier hermetic centrifugal water chilling machines.



Baltimore, Maryland, service engineer reports: "'Freon' refrigerants help us do a better servicing job. It's dry and safe—the most dependable refrigerant on the market today."

East Rockaway, New York, contractor reports: "Nothing works like 'Freon'. I'm convinced it's the best refrigerant on the market—safe and dependable for any job."



Louisville, Kentucky, service man reports: "'Freon' is the world's best refrigerant for our money. It's pure, dry and safe—never causes one bit of worry or trouble."

Atlanta, Georgia, contractor reports: "We've never had a bad batch of 'Freon' in the 25 years we've used it. It's never caused us trouble on the job or—after years of service—in a system."

Tucson, Arizona, service man reports: "'Freon' refrigerants help us do the best job possible. They're reliable and safe. Since 'Freon' came out, we've never used anything else."

St. Louis, Missouri, service man reports: "We've never had a moisture or corrosion problem in equipment charged with 'Freon.' It's absolutely dependable—always pure and dry."

All over the country, users are talking about the advantages of Freon* refrigerants

East, west, north or south—contractors and service men appreciate the extra quality of "Freon" refrigerants that costs them nothing extra.

"Freon" is today's premium-quality refrigerant . . . stable, pure, dry —nonflammable, nonexplosive, nontoxic. It's time-tested—in use over 27 years and made only by Du Pont—backed by years of technical and manufacturing leadership.

Specify "Freon" refrigerants for every refrigerant need. Your Du Pont wholesaler has it—now capped in gold and factory-sealed to guard its purity till you're ready to use it.

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

FREON® *premium quality* **REFRIGERANTS**

**Freon and combinations of Freon- or F- with numerals are Du Pont's registered trademarks for its fluorinated hydrocarbon refrigerants.*

you'll want to know . . .

1960: A YEAR OF PROMISE

Economists Optimistic

THE ECONOMIC OUTLOOK for the first year of the new decade is anticipated with optimism. This is the general concensus of the leaders of various segments of the industry queried in *Heating, Piping & Air Conditioning's* annual survey of 1960 economic and business prospects. Certain qualifications to this spirit of optimism do exist as a result of recent labor difficulties in some areas, but with resolution of these problems, the business economy is expected to continue its upswing.

According to a recent poll taken by the F. W. Dodge Corp. of 273 of the nation's leading economists in business, government, and universities, 1960 will be a record-breaking year in most respects. A sizable majority, 65 percent, expect total business activity, as measured by Gross National Product, to rise steadily during the year. Dr. George Cline Smith, Dodge vice president, reported that the results of the poll show that GNP will reach an annual rate of $514 billion by the fourth quarter of 1960, a gain of 6 percent over the mid-1959 level. The Federal Reserve index of industrial production is expected to rise 3 percent from the mid-1959 level, reaching 160 by the end of 1960, Dr. Smith reported.

MCAA Outlook Bright

BUILDING construction is expected to increase during 1960, according to the Mechanical Contractors Association of America. William P. Scott, Jr., president of the association, stated that, "judging by all indications, 1960 should prove to be one of the greatest, if not the greatest, in the mechanical contracting field. The conclusion of the steel strike is showing, that there are many areas where increases are occurring, not only in new building construction, but also in maintenance and modernization," Mr. Scott said.

"Through the efforts of the construction industry joint conference, management and labor alike are pushing the program for in-plant maintenance to be performed by the construction trades. Already results are being obtained, and we can expect a large increase in this type of work," he reported.

Mr. Scott also noted that "there apparently will be a shortage of trained mechanics during 1960 and every effort should be made to fill this void."

ASA Plans Standards

THE American Standards Association states that it expects continued progress in the field of piping during 1960. According to ASA, a revision of the American Standard for Steel Pipe Flanges and Flanged Fittings, B16.5-1957 will be forthcoming and will bring it up to date with industry practice.

Another standard for non-ferrous flanges other than brass or bronze is in preparation and, according to ASA, it is likely that this material will be added to B16.5 as an appendix. A revision of the American Standard of Steel Butt-Welding Fittings, B16.9-1958 is almost complete, as is a new standard on Cast Iron Butt-Welding Fittings.

The revision of the American Standard on Unified and American Screw Threads, B1.1-1949, is expected to receive ASA approval early in 1960, and it is hoped that the American Standard on Pipe Threads, B2.1-1945 will be revised.

It is also planned that, during 1960, sections of the Code for Pressure Piping will be completed on power piping and refrigeration piping.

Steel Pipe Shows Gains

THE Committee on Steel Pipe Research of the American Iron and Steel Institute reports an anticipated overall increase in its standard pipe shipments during 1960 of some 15 percent. Interestingly, among the primary reasons for this rise is the protracted steel strike. According to George D. Lain, research engineer with the committee, the steel stoppage resulted in depleted inventories in standard pipe. These low inventories, coupled with the necessary supply to meet normal requirements, will keep the pressure on producers of such pipe during the early months of 1960.

Future of Copper Bright

THE future of copper metals in the field of heating, piping, and air conditioning is highly encouraging. According to T. E. Veltfort, managing director of the Copper and Brass Research Association, the growing significance of the use of tubed copper panels for solar heating in Florida, California, and New Mexico as well as the acceptance of copper tube for radiant heating and snow melting throughout the U. S. promise an even more expanded market for copper metal products during 1960.

It must be noted, however, that Mr. Veltfort observes that the 1960 potential of these markets for the copper and brass mill products, while basically promising, must be considered and cautious. Three basic problems exist, both for the brass mill industry and for several industries which constitute its major markets.

First, labor difficulties which have beset allied basic metals industries have also existed in the copper industry. The Association notes that permanent resolution of the problem is essential. The other two factors which will influence the industry's market potential are the Federal Reserve's "tight money" program and the impact of imports.

"The brass mill products import problem unfortunately promises to get worse before a favorable turn can be expected. These imports are now entering the U. S. at a rate of nearly 200,000,000 lb annually," he said.

These factors notwithstanding, Mr. Veltfort states that, "it may be safely asserted that as the installations of heating, piping, and air conditioning systems expand in 1960, the use of the copper metals will expand with them."

Air Conditioning to Go Up

THE AIR CONDITIONING industry is entering a record breaking decade saleswise, according to George S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute. Mr. Jones said the air conditioning industry has had the best year in its history in 1959, and 1960 promises to break all records for the sale of all types and sizes of equipment using the mechanical refrigeration cycle.

Mr. Jones reported that 1959 sales of all products in our field will run as much as 20 percent ahead of 1958, and 10 to 15 percent ahead of the best previous year which was 1956. Manufacturers' shipments of refrigeration compressors were running about 40 percent ahead of 1958 for the first three quarters of 1959.

The sales of unitary air conditioners probably will show almost this large a gain over 1958, based on figures for the first nine months of 1959, and a total shipment figure of 320,000 units is being estimated, compared with 231,000 in 1958, he said.

ARI figures indicate that the installation of the big systems for cooling office buildings, apartments and hotels, industrial plants, and similar large structures has continued its upward trend in 1959. Early estimates are that the installed value of such systems in 1959 will be more than $600 million, a gain of about 10 percent from the $550 million in 1958, and almost 60 percent over the 1954 installed value of $379 million.

Manufacturers of system components feel that the potential for this type of equipment is great, particularly in the industrial field. Industrial management is coming to recognize more acutely each year the economic benefits of industrial air conditioning through improved employee health and morale, lower rates of absenteeism, increased efficiency and greater production. Hence, the outlook for continued gains in this field supports the overall optimistic forecast for 1960 and succeeding years, according to Mr. Jones.

Welding Picture Good

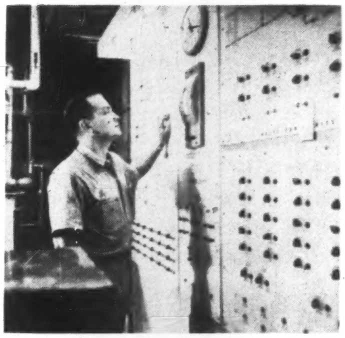
WELDING's importance to the heating, piping, and air conditioning field is expected to continue to increase during 1960, according to Fred L. Plummer, national secretary of the American Welding Society.

"Important advances during 1960 in the joining of metals will probably result from the broader application of established techniques and proven economies of inert-gas-shielded metal and tungsten-arc welding and of some of the newer developments in brazing and resistance welding."

Mr. Plummer said that, "new metal joining processes are being developed and will be used which are both effective and economical. Electron-beam welding will become more important in rocket, missile, and aircraft applications for joining refractory metals, metals with high thermal conductivity and highly reactive metals."

"Ultrasonic welding should prove useful in joining difficult-to-weld metals such as beryllium and molybdenum, and for dissimilar metal combinations. Electro-

("1960: A Year of Promise" is continued on page 352; You'll Want to Know continues on page 65.)



How Air Conditioning Aids in Cancer Research

A HIGHLY COMPLICATED system of air conditioning and ventilation plays an important part in the Sloan-Kettering Institute's newly opened Walker Cancer Research Laboratory in Rye, N.Y., according to the Wigton-Abbott Corp.

The laboratory has three floors of about 95,000 sq ft of area, and its air conditioning capacity is approximately 530 tons. This is unusually high for a building of this size.

The reasons for this heavy load stem from the critical nature of the experimental work conducted in the building. The animal rooms are located at the core of the building and close control of the temperature and humidity in these rooms is essential to the welfare of the animals. Also, to control odors, the animal rooms are supplied with air drawn from outside and electrostically filtered.

The comfort of these animals, primarily rats and mice, is an around-the-clock concern at the laboratory, since the laboratory's animals are an integral part of its cancer research. An operating engineer mans a supervisory control center, shown the the photograph, in the basement of the building. Located here is an electronic panel that permits constant control and supervision of the humidity and temperature in the rooms.

If the temperature in any of the rooms dips or rises, an alarm is received on the panel of the control center. The location of the trouble is also indicated, permitting necessary corrections to be made immediately.

An additional precaution was taken with the installation of two refrigeration compressors to insure continuous air conditioning at all times. Should one compressor fail, the animal room systems can be kept operating by switching to another.

The two compressors are located in the boiler room. The chilled water from these units is circulated to the cooling coils of the air handling equipment by two 20 hp pumps. Also located in the boiler room are two 250 hp low pressure boilers which provide steam to the heating coils.

The heating, ventilating, and air conditioning system contains four factory-built vertical floor mounted units to air condition the animal rooms. Each unit consists of a base reservoir section, chilled water coil with spray humidifier, a fan section, an adjustable motor base, an adjustable pitch v-belt drive, and belt guard and vibration isolators.

A reheat coil and humidifier is installed in the discharge duct to each animal room. They are controlled by electronic thermostats and humidistats located in each animal room.

One hundred percent outside air is supplied to each animal room through ducts and diffusers which were selected to provide air distribution at low velocities to prevent drafts.

The diffusers are recessed in a hung ceiling. The lowered ceiling provides for cleanliness and permits the mixing of secondary air with primary air at the ceiling before it reaches the occupancy zone below.

The four floor mounted multizone units are used to air condition the laboratory modules located around the perimeter of the building.

These units are controlled by thermostats located in exterior and interior zones. Each unit supplies air in varying percentages, depending upon the space requirements.

Air from the hoods in the laboratories is exhausted by individual hood exhaust fans located on the roof. Perimeter baseboard hot water radiation provides for part of the heat loss.

Fluid Controls Institute Holds 1959 Fall Meeting

THE 1959 fall meeting of the Fluid Controls Institute, Inc., was held at the Seaview Country Club, Absecon, N. J. on October 25-27. The meeting was attended by leading manufacturers of automatic regulator valves, control valves, solenoid valves, space heating specialties, steam and gas traps and steam heating pumps.

Among topics under discussion at the meeting, presided at by James R. Lawler, Jr., of Lawler Automatic Controls, Inc., president of the Institute, were the development of voluntary standards and specifications pertinent to various sections of the Institute.

The next meeting of the Fluid Controls Institute is scheduled for May 11-14, 1960 at the Greenbrier, White Sulpher Springs, W. Va.

Ventilation Conference Scheduled for Feb. 15-18

THE 9th annual industrial ventilation conference at Michigan State University will be held February 15-18, 1960 at East Lansing, Mich. in the Kellogg Center. The conference is co-sponsored by the College of Engineering and the Division of Occupational Health of the Michigan Department of Health.

Information about the conference is jointly sponsored by the Colgan State University, Kellogg Center for Continuing Education, East Lansing, Mich.

How Gas Air Conditions Arkansas Supermarket

Gas is providing all of the electrical and air conditioning and most of the refrigeration requirements for Ward's Foodland in Prescott, Arkansas, according to the Arkansas Louisiana Gas Co.

Before it opened, the supermarket had installed a gas-operated combination refrigeration and air conditioning system. The same gas driven compressor that runs most of the refrigeration equipment in the supermarket also provides 13 tons of comfort cooling for the 5000 sq ft customer area.

The system operates by condensing refrigerant 12 to liquid in an evaporative condenser which is distributed via individual refrigeration lines. Air conditioning is accomplished by one central air handling unit suspended above the ceiling in the rear of the store. A direct-expansion coil provides 13 tons of cooling with two-stage thermostat control. A small hot water coil furnishes winter heating; hot water is circulated to the coil from a small package boiler. A duct system above the ceiling distributes cool and warm air through diffusers in the building.

Recently, the supermarket installed a 50 kw a-c natural gas driven generator to furnish all of the store's electricity needs.

Michigan Bank Provides Customer Comfort

Comfort for both customer and employee is stressed at the Manufacturers National Bank's new office in Detroit, Mich.

The building is fully air conditioned using a "split" system. It supplies cool air from overhead in summer and warm air in winter. Finned pipe radiation under the windows and on exterior walls provides additional heat in winter. Most of the air is returned to a multiple zone ventilating unit, where it is mixed with outdoor air which is introduced into the system at all times. This, in turn, is redistributed through the building. Drive-in window booths are cooled and heated by using a fan and coil cabinet heater located in each booth. Fan-coil units are also used for heating the vestibules in the main building.

The refrigeration system consists of an evaporative condenser, refrigeration compressor and water chiller that supplies chilled water to the cooling coil. The evaporative condenser is used to conserve water for air conditioning. It has a 45 ton capacity. The heating system consists of a gas fired boiler and two pumps which circulate hot water constantly to the heating coils and finned pipe radiation during the heating season.

Compressor Body Shipments Increase In First Half 1959

Manufacturers' shipments of compressor bodies in the first half of 1959 totaled 3,080,560 units, a gain of nearly 44 percent over shipments or the first six months of 1958, according to the Air-Conditioning and Refrigeration Institute. The 1958 total for the first half of the year was 2,139,885 units.

The Air-Conditioning and Refrigeration Institute offices are at 1346 Connecticut Ave., N.W. Washington 6, D.C.

Electronic Tube Plant Requires Air Filtration

Air filtration and humidity control are essential in the General Electric Co. power tube plant in Scranton, Pa., where key electronic tubes used in a number of operational and developmental missiles are manufactured. General Electric power tube dept. engineers say the exacting atmosphere controls being used in the tube assembly area will result in greater tube reliability and longer life operation.

The area, which has been painted white to facilitate daily cleaning, is supplied with specially filtered and controlled air to keep out dust, lint, and other foreign matter which, if sealed into a tube, could conceivably cause it to fail.

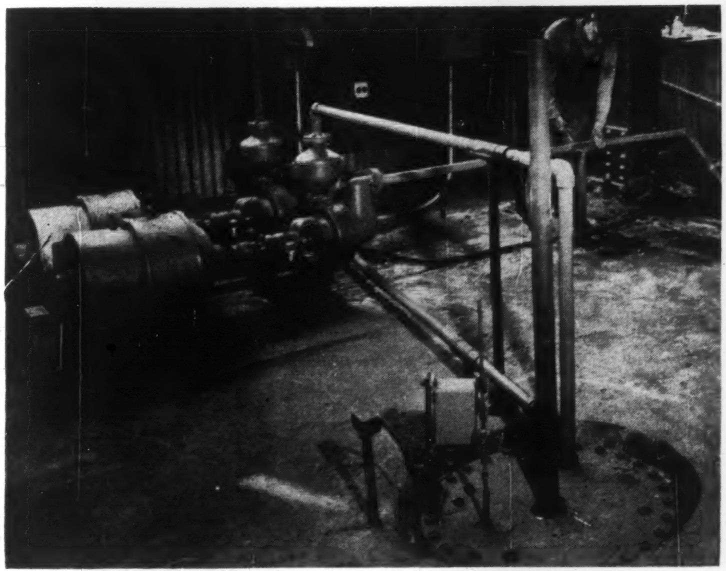
The filtering system completely changes the air in the area every 6 minutes and removes particles as small as 1/10 micron — less than 1/250,000 in. in diam.

Relative humidity is maintained at 35 percent. Humidity control is essential because small amounts of moisture condensing on metal parts can cause rust, detectable only by microscopic examination, which can later result in tube failure.

R & D Contracts Guide Available

A new report titled "Defense Research and Development Contracts Guide" has recently been made available. The guide tells how and where to obtain contracts for research, development, engineering, test and evaluations from 228 separate installations of the Army, Navy, Air Force, and Advanced Research Projects Agency.

Copies of the 1960 edition, at $25.00 per copy, may be obtained from Vincent F. Callahan, Publisher, 1420 New York Ave., N.W., Washington 5, D. C.



How Plastic Piping Aids Pittsburgh Plant In Waste Disposal

A NEW PIPING system has been installed in the new sewage plant facilities operated by the Allegheny County Sanitary Authority, according to A. M. Byers Co.

The system, designed to curtail pollution of Pittsburgh's rivers, will dispose of galvanizing process pickling waste. Instead of being dumped into the Monongahela River, which flows to a junction with the Allegheny to form the Ohio River, waste is conveyed from plant storage vats to tank trucks, and then to inland disposal sites. This system of waste disposal is considered a major contribution to greater Pittsburgh's river clean-up.

Getting the plant acid wastes to the truck loading area—150 ft from storage vats—involves dual transfer of pickling waste through more than 200 ft of 1½ in. diam PVC pipe. Plastic pipe was selected for this service because of the severely corrosive manner in which pickling wastes, 3 to 8 percent sulphuric acid solution, attack metal pipe.

In making the installation, one plastic pipe run, connected to a pump, is extended from the bottom of the waste run-off sump. The pump draws pickling solution from the sump through the line to a 15,000 gal waste storage vat beneath the floor. By means of another pump, a second line conveys pickling waste from a storage vat to truck loading area.

Approximately 30,000 gal of pickling waste are disposed of each week at the plant. Operating temperature of the plastic line varies between 80 and 120 F, at pressures between 40 to 50 psi.

U. of Florida Holds Heat Transfer Symposium

THE Mechanical Engineering Dept. of the University of Florida will hold its annual Heat Transfer Symposium on March 7-8, 1960. Among the sessions planned are Basic Principles, Temperature and Its Measurement, Heat Exchangers, Graphical Methods, the Hyraulic Analog, and other selected topics.

Additional information on the symposium may be obtained from Professor John C. Reed, Head, Mechanical Engineering Dept., or Professor E. A. Farber, departmental program director, University of Florida, Gainesville, Fla.

Gas Water Heater Shipments Reach New High

1959 SHIPMENTS by manufacturers of gas-fired automatic storage water heaters have surpassed the previous all-time one-year high, recorded in 1955, according to the Gas Appliance Manufacturers Association.

Total units for the January to November, 1959 period were 2,756,400.

Technical Writing Series Set For June

TECHNICAL WRITING as a tool for industry will be the feature of the eighth annual Technical Writers' Institute scheduled for June 13-17 at Rennselaer Polytechnic Institute. Information on the lecture series may be obtained from Professor Jay R. Gould, Director, Technical Writers' Institute, Troy, N.Y.

Unitary Air Conditioner Shipments Up, ARI States

UNITARY air conditioners in the first three quarters of 1959 totaled 234,444 units (excluding coils), a gain of 47 percent over 1958.

According to the Air-Conditioning and Refrigeration Institute, the percentage gain in shipments of unitary heat pumps is more than double that of overall unitary equipment. Heat pump units shipped in the first nine months of 1959 totaled 25,834 units, a gain of 108 percent over heat pump shipments in the first three quarters of 1958. More than 60 percent of the heat pumps shipped in the 1959 period were self contained.

New ARI Standard Available for Liquid Chilling Packages

A NEW ARI standard for centrifugal liquid-chilling packages has been published by the Air-Conditioning and Refrigeration Institute. The standard does not apply to liquid-chilling packages employing reciprocating compressors, but does apply to both open and hermetic centrifugal compressors.

Copies of the standard, numbered "550-59", may be obtained from the Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N.W., Washington 6, D. C., at 40 cents each.

Report Oil Burner Research Progress

OIL BURNER research in the petroleum industry is making substantial progress, according to the American Petroleum Institute.

David W. Locklin of the Battelle Memorial Institute recently reported that research is now under way in the atomization of fuels, fuel-air mixing, catalytic and surface combustion, combustion acoustics, new fuel-oil uses, new types of burners, modifications of existing burners and improvement in field installations to assist marketing and servicing organizations.

Mr. Locklin also listed as concepts having promise for future research: controlled recirculation of combustion products, catalytic and surface combustion, vaporization precombustion zones, unsteady state combustion, unusual atomization techniques, and modified systems for combustion air.

ARI Annual Meeting Set for November 18-22

THE Air-Conditioning And Refrigeration Institute will hold its 1960 annual meeting at the Hollywood Beach, Fla., Hotel, November 18-22.

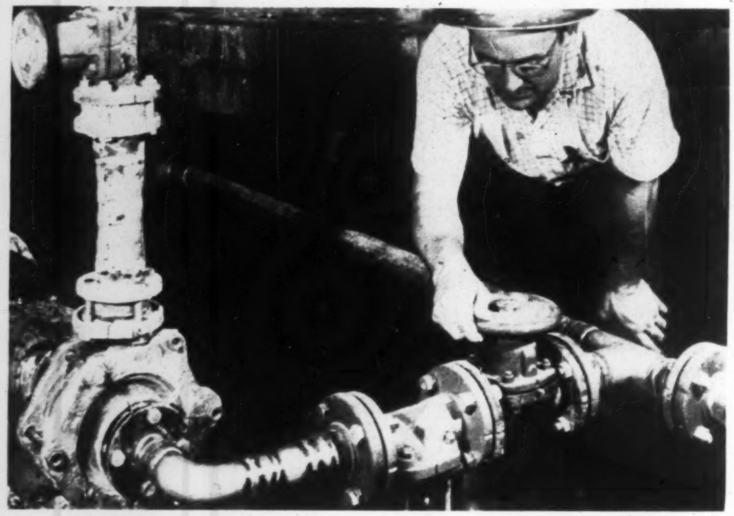
ARI also announced that its board of directors will meet May 2-3 at the Homestead, Hot Springs, Va.

Geophysical Year To Be Subject of Lectures

THE International Geophysical Year, 1957-58 will be the subject of a lecture series to be presented starting February 10 by the Special Courses Division of Western Reserve University's Cleveland College.

The series, which is divided into two sections, will deal with the "Earth Sciences" during the first four lectures and will consider "Atmosphere Research and Earth Environs" during the second half. The series will be held on eight consecutive Wednesdays.

For further information, contact Special Courses, Cleveland College, Western Reserve University, Cleveland 6, O.



Stainless Steel Piping Serves Acid Plant

TWO NEW light wall stainless steel piping systems at the American Synthetic Rubber Corp. plant in Louisville, Ky. have provided greater flow area, according to Tube Turns Div. of Chemetron Corp.

One of the new installations carries fatty acids at about 50 psi and 120 to 130 F; and the other conveys a corrosive solution of concentrated alum at 5 to 10 psi and about 120 F. Both utilize pipe in 1½ and 2 in. sizes.

Changes of direction and connections are made with long-tangent fittings, flanges and fillet-welded aligning connectors.

One of the two new piping systems serves two 15,000 gal resin-lined holding tanks where fatty acid is brought in by over-the-road tankers. From there it is piped to metering stations and then to three 10,000 gal make-up tanks to be mixed with caustic soda, water, and other ingredients to form a soap used in emulsifying reactants. The fatty acid is not particularly corrosive, it was reported; use of stainless steel is dictated by the importance of avoiding iron pickup from carbon steel that might cause discoloration. Top pressures of 50 psi and a moderate product temperature made it unnecessary to use the standard-weight piping that would ordinarily have been specified.

For the concentrated alum lines, light-wall stainless steel replaced existing piping that had served two 7000 gal cypress holding tanks and related facilities. The alum solution is used to coagulate liquid latex.

New Smog Reduction Method Developed by Franklin Institute

SIGNIFICANT REDUCTIONS in the amount of nitrogen oxides, one of the two main components of smog have been announced by the Franklin Institute. The Institute Laboratories said they used chromite catalysts and carbon monoxide to reduce the amount emitted from automobile exhaust.

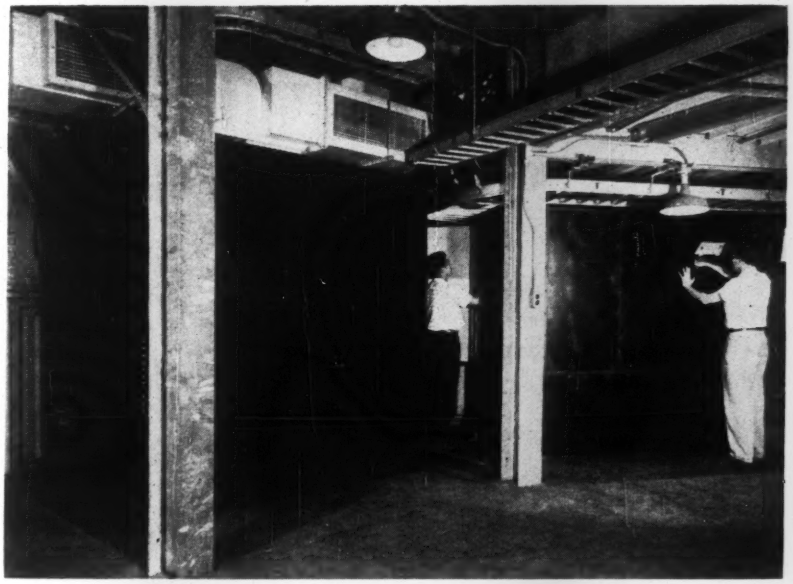
Institute scientists in experiments used chromites to aid carbon monoxide already present in the auto exhaust to further reduce the amount of nitric oxide in the exhaust. The scientists conclude that with the reduction of nitric oxide sent into the air which in some experiments was more than 90 percent, the amount of smog formed would be greatly reduced.

Whether this new method of reducing photochemical smog will be the way to rid Los Angeles and other cities of eye-irritating smog has not yet been determined, according to Dr. Nicol H. Smith, Franklin Institute Laboratories director. The chromite catalytic method, Dr. Smith said, holds great promise, but more study is required before it can be ascertained if the chromites will withstand the poisoning effects from lead, and other compounds found in the exhaust.

If the chromites do remain stable in future experiments, they promise to be an economical means of reducing photochemical smog.

Smog is formed by nitrogen oxides and hydrocarbons which emit from auto exhaust and react with the atmosphere. Scientists have known for a long time that elimination of either hydrocarbons or nitrogen oxides from the exhaust would contribute materially to a reduction of photochemical smog. However, in the past, according to Dr. Smith, most scientists have concentrated on the elimination of the residual hydrocarbons by oxidation, catalytic or non catalytic, in order to control smog.

Chromites eliminate the need for additional equipment in a system to reduce smog.



Air Force Radar Equipment Uses Packaged Coolers

COOLING SYSTEMS are being built to meet the demanding requirements of radar towers, according to Carrier Corp. The U.S. Air Force required packaged units that work equally as well in the tropics as in salt water atmosphere or tropic regions, are capable of being parachuted to earth from cargo planes, and are ready to function when supplied with electric power.

The cooling systems are required in order to assure constant operating temperatures for highly sensitive electronic tubes and electrical switches within the radar towers.

In each radar tower there are three packaged air conditioning units and two air-cooled refrigeration plants. Components for both units are encased in boxes approximately the size of an 8 ft hallway and framed with 1½ in. angle iron.

The air conditioners have a cooling capacity of 15 tons. Three separate refrigeration circuits using 7½ hp hermetic reciprocating compressors are located at the bottom of each unit. Discharge velocity of conditioned air directed into the space or lead off is 450 fpm. The volume of condensing air is 11,000 cfm.

The packaged cooler uses similar refrigeration systems. Glycol is the coolant circulated through small passages in the electronic devices next to closely integrated heat producing sources, such as vacuum tubes.

Crane Co. Purchases National-U.S. Radiator Corp.

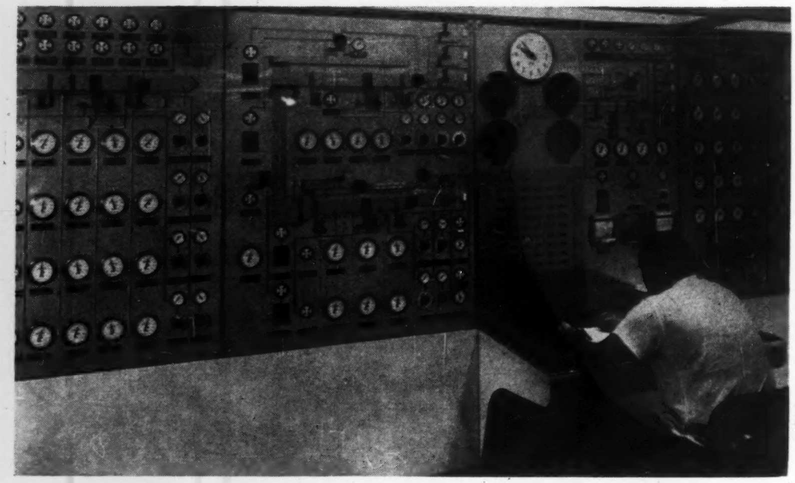
LATE last month Theodore B. Focke, president of National-U.S. Radiator Corp. announced the purchase of the corporation by the Crane Co. He said an agreement had been reached between Thomas M. Evans, chairman of Crane Co. and William T. Golden, chairman of National-U.S. Radiator Corp. together with himself to acquire the operating assets of the corporation for cash. All divisions will continue to operate as previously.

Smithsonian Gets Early American Pyrometers

EARLY AMERICAN TEMPERATURES measuring devices used in steel making have been presented to the Smithsonian Institution by the Brown Instruments Division of Minneapolis-Honeywell Regulator Co. The Washington, D.C. national museum accepted the instruments, which are pyrometers, in order to trace the development of temperature measurement in industry from mechanical means to present day automatic control methods.

Earliest of the pyrometers turned over to the Smithsonian are a round brass model patented in 1872 and a portable model patented in 1884. These operated on the basis of the difference between the length of a rod of iron, which expands in heat, and that of a rod of non-expanding graphite. The pyrometers mechanically multiplied this difference and moved a pointer over a dial graduated in degrees of temperature. Until the invention of these devices, industry depended on relatively crude foreign made furnace temperature measuring instruments.

In accepting the instruments, Dr. Leonard Carmichael, Smithsonian secretary, said they "enrich the national treasury of inventions that are significant technical milestones in our country's industrial growth."



Automated Master Panel Controls Air Conditioning System In New Engineering Center

A MASTER PANEL controls the highly automated air conditioning and outdoor air system in the Engineering Building at Union Carbide Chemical Company's South Charleston, West Virginia Technical Center.

The control center governs the the more than 1600 instruments and controls involved in the Engineering Building refrigeration and air conditioning system.

In addition to the central conditioning unit, over 800 individual air tempering units are installed in offices to further control the internal atmosphere. Two steam absorption refrigeration machines with a total capacity of 980 tons consume 19,000 lb of steam per hr at a pressure of 12 psi. The cooling tower is a 3-cell double-flow type mounted on the roof of the Engineering Building. The system handles 103,000 cfm of air lowering the temperature to 72 F with 25 percent of the air recirculated back to the building.

The scope of activity at the Center ranges from theoretical studies on molecular structure and basic research in chemical reaction mechanisms, to pilot scale production of new products and the subsequent engineering and design of commercial production facilities.

How Radiant Heat Floor Panel System Heats Large Hospital

CONNECTICUT State Hospital's intensive treatment building in Middletown, Conn. is the largest hospital structure in the New England area employing radiant heating, according to A. M. Byers Co.

The entire four story treatment building, including the basement, is heated with 93,000 ft of 1 in. diam wrought iron pipe coils. Hot water is the heating medium.

Before being buried in the concrete flooring, the installation was given a weld soap test for 12 hours under a 125 psi pressure.

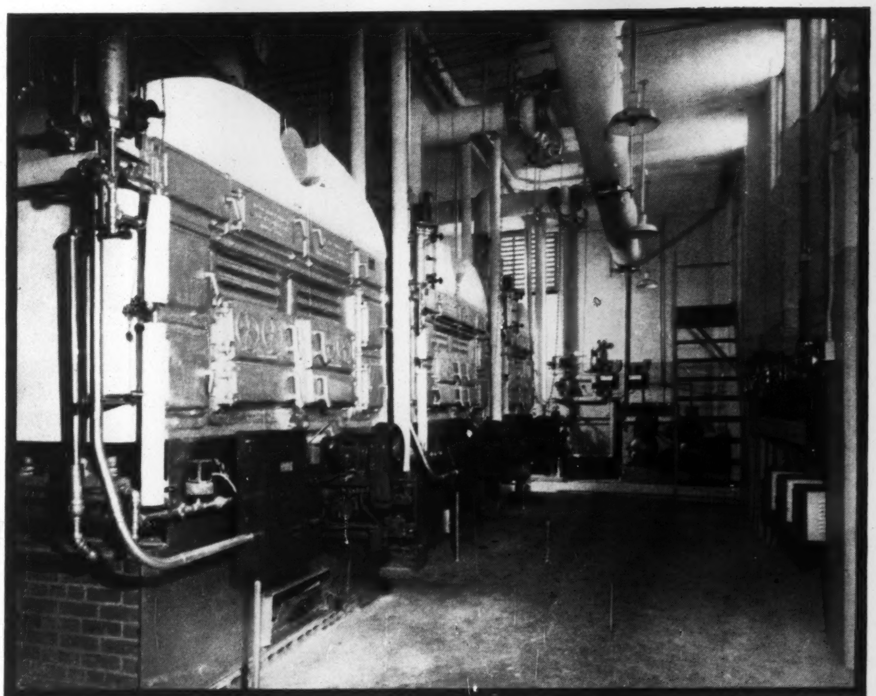
Hot water is pumped by a circulator with a capacity of 200 to 270 gpm against a 30 ft head.

Three Canned Motor Pumps Serve Plant

THREE CANNED MOTOR PUMPS for use in a controlled-circulation boiler will be installed at the Possum Point Station of Virginia Electric and Power Co. near Quantico, Va., according to Westinghouse Electric Corp.

The 11,000 gpm pumps will operate at 1800 rpm and are designed to pump fluids up to 660 F at 3000 psi. Delivery of the units is scheduled for late 1961.

Three H. B. Smith Boilers Deliver 15 Million Btu.



St. Stanislaus Novitiate, "Shadowbrook," Lenox, Mass. *Architect:* J. Gerald Phelan, Bridgeport, Conn. *Engineers:* Fletcher-Thompson Inc., Bridgeport, Conn. *Heating Contractor:* M. J. Flaherty, Boston, Mass.

After a spectacular fire had destroyed the main building of the St. Stanislaus Novitiate – formerly the fabulous Berkshire residence of Andrew Carnegie – in Lenox, Massachusetts, the architectural firm of J. Gerald Phelan, Bridgeport, Connecticut was selected to design a new building. The result – a building as beautiful by mid-twentieth century standards as was the old Carnegie Mansion by the standards of its day. The boiler plant, designed by Fletcher-Thompson Inc., Engineers, consists of the three H. B. Smith No. 60-S-21 oil-fired boilers with combined capacities of over 15 million Btu. Thus dependable heat can be counted on for many, many years to come, for H. B. Smith cast iron boilers have a unique record of amazing longevity. Add their moderate initial cost, high efficiency, economy and extremely low maintenance cost and you have the reasons why H. B. Smith boilers deliver heat at the lowest possible costs per year.

H.B. Smith **CAST IRON BOILERS**

THE H. B. SMITH COMPANY, INC., WESTFIELD, MASSACHUSETTS • Est. 1853

STEEL
J&L QUALITY STEEL PIPE
sold by over
1200 Leading Distributors
... let them serve you

"More money in the bank by using J&L pipe"

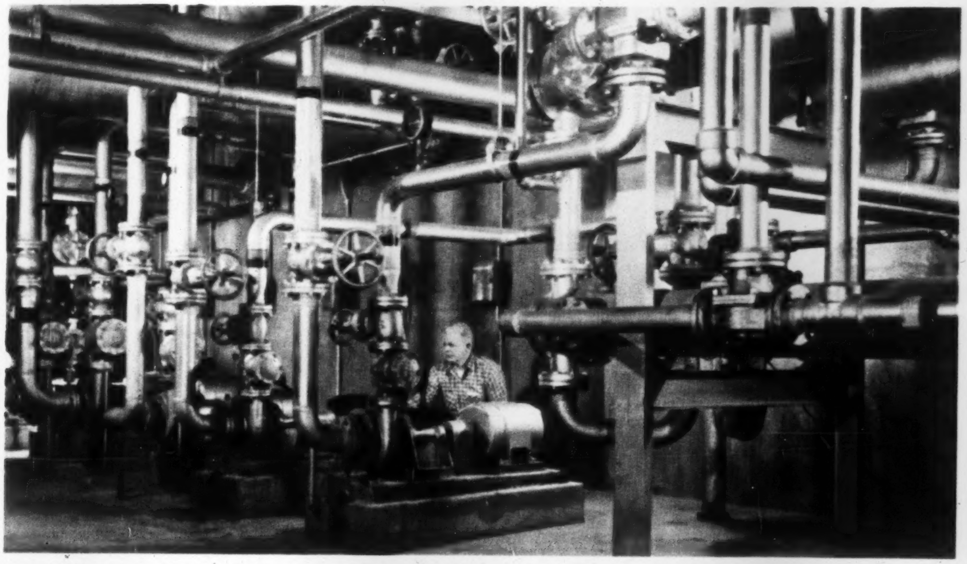
. . . reports Akron contractor

"We use a great deal of J&L standard size pipe because our reputation and our profits depend on our work and the materials we use. J&L pipe gives us sound joints and uniform strength," says Mr. George W. Spohn, of the Spohn Heating and Ventilating Company, Akron, Ohio.

This reputation for dependability of J&L pipe is built on years of outstanding performance. When you specify J&L, you get uniform thickness and size, roundness and straightness, strength and ductility.

J&L pipe is produced by a major integrated steel company on the most modern equipment. Typical of these advanced facilities are two new continuous weld mills for producing Jal-Con-Weld pipe from ½ inch through 4 inches. Jal-Con-Weld pipe is formed by pressure rolls in sizes larger than the finished diameter. Pipe is then reduced in succeeding sets of rolls. This forges the weld and improves metallurgical qualities.

All J&L pipe is manufactured under rigid quality control that assures production of superior products. It will pay you to standardize on dependable J&L pipe. Call your nearest J&L distributor or write Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Penna.



Over 300 tons of top quality J&L pipe, ranging in size from 2 inches to 12 inches, were recently installed by the Spohn Heating and Ventilating Company in this modern Akron municipal sewage treatment plant. Dependable service is a must in this operation covering a 700-mile municipal system.

STEEL

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

THERMAL

AIR CONDITIONING EQUIPMENT

- ENGINEERED FOR MAXIMUM EFFICIENCY
- BUILT FOR LONG LIFE
- SPECIFIED WITH CONFIDENCE

DESIGN FEATURES

1. Thermal units are of sectional construction, which means greater overall ruggedness.
2. All sections welded, to produce maximum rigidity. Thorough reinforcement of sections adds sturdiness.
3. Specially designed slide rails permit ready removal of coils for cleaning.
4. Cabinets fabricated of best quality, black, cold-rolled furniture steel.
5. Cabinets bonderized and finished with baked-on enamel for strong protection against corrosion.
6. Drain connections side-mounted to avoid encroachment on head room.
7. Horizontal air flow through cooling coils in vertical units eliminates hold-up of condensate.
8. Conditioners can be furnished with by-pass only, or internal face and external by-pass.
9. Units available with combination filter and mixing boxes, for either high or low velocity filters.

VERTICAL MODEL

CENTRAL PLANT AIR CONDITIONERS

22 Casing Sizes 500 to 35,000 cfm
Horizontal and Vertical Models
1 to 100-tons cooling capacity

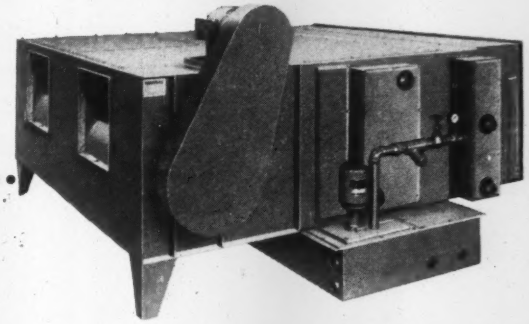
HORIZONTAL MODEL
STYLE C

MULTIZONE CONDITIONERS

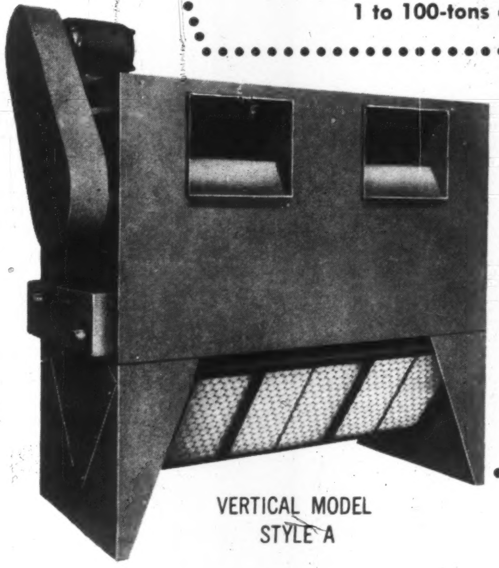
22 Casing Sizes 500 to 35,000 cfm
Horizontal and Vertical Models
1 to 100-tons cooling capacity

SPRAYED COIL CONDITIONERS

22 Casing Sizes 500 to 35,000 cfm
Horizontal and Vertical Models
1 to 100-tons cooling capacity



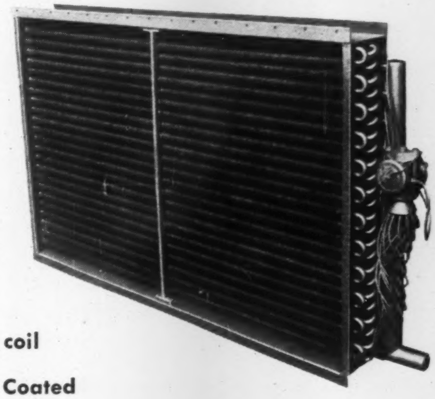
HORIZONTAL MODEL



VERTICAL MODEL
STYLE A

HEATING and VENTILATING UNITS

4 Models — Vertical, Inverted, Horizontal, Wall Type
3 Types — 1 Fan, 2 Fan, 3 Fan
22 Casing Sizes in Each Model
500 to 35,000 cfm



DIRECT EXPANSION COIL

COOLING and HEATING COILS

Non-Freeze Steam
Direct Expansion
Standard Steam
Chilled-Water (incl.
cleanable tube type)
Hot-Water
1 to 10 Rows — Cooling
1 to 4 Rows — Hot Water
1 & 2 Rows — Steam
.81 to 30.62 sq. ft. face area in one coil
Copper Tubes — Aluminum Fins
Copper Tubes — Copper Fins — Solder Coated

See our exhibit at Booth 213
2nd Southwest Heating &
Air Conditioning Exposition
Memorial Auditorium
Dallas, Texas
Feb. 1-4, 1960

1 FAN MODEL

AIR COOLED CONDENSERS

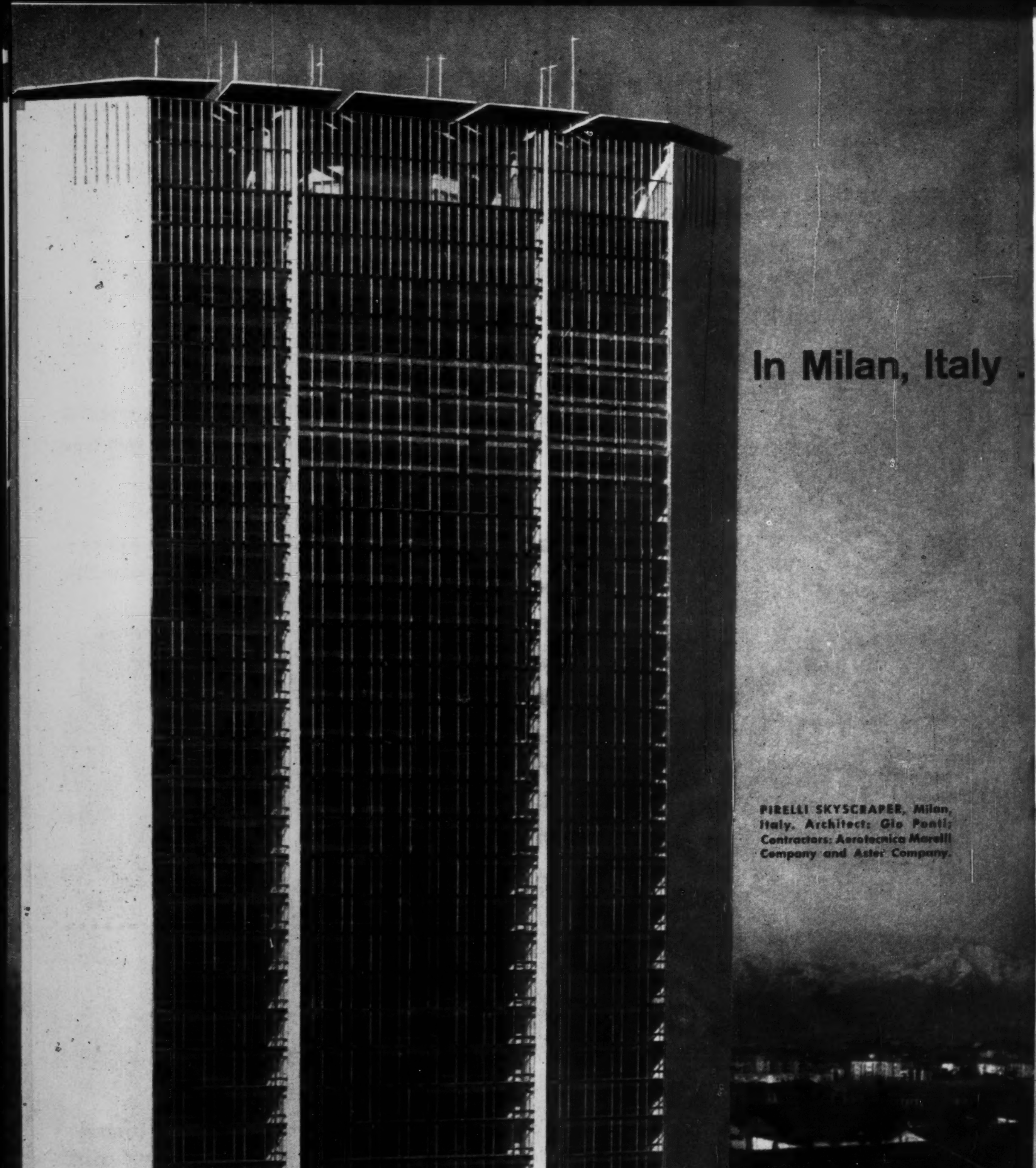
6 Basic Sizes (5 to 20 tons) can be installed in multiple for any greater tonnage.

ADVANTAGES

- Low first cost.
- Winter head pressure control.
- Low maintenance cost.
- Low operating cost.
- Built for indoor or outdoor installation.

FASTEST SHIPPING SCHEDULE

Quality Products Since 1945
THERMAL ENGINEERING CORPORATION
2605 W. DALLAS • P. O. BOX 13254
HOUSTON 19, TEXAS



In Milan, Italy .

PIRELLI SKYSCRAPER, Milan, Italy. Architect: Gio Ponti; Contractors: Aerotecnica Marelli Company and Aster Company.

GENERAL MILLS BUILDING, Golden Valley, Minnesota. Architects & Engineers: Skidmore, Owings & Merrill; Mechanical Contractor: Reuben L. Anderson—Cherne, Inc.; Ventilation Contractor: Iowa Sheet Metal Contractors.

. . . in Minnesota . . . . in California . . .

KAISER CENTER, Oakland, California. Architects: Welton Becket & Associates; Mechanical and Electrical Engineers: Dudley Deane & Associates.

three building-planning groups came to the same decision:

CLEAN AIR by AAF

Facts behind the decision:

Fact No. 1—Unless you consider *all kinds* of air filters, you can't be sure of getting *optimum* correlation of filter performance, filter cost and filter maintenance.

Fact No. 2—AAF is the one-and-only company that *makes* all kinds of filters.

From the score of filters in the AAF line, there's one that's engineered and constructed to give you the *air-cleaning efficiency you need plus the maintenance characteristics you want.*

Take a look at what we mean by a *complete* line of air filters. Call your local AAF representative or write direct for Bulletin 510B. Address: Mr. Robert Moore, American Air Filter Company, Inc., 376 Central Avenue, Louisville, Kentucky.

AAF American Air Filter

BETTER AIR IS OUR BUSINESS

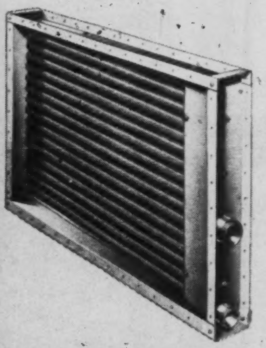
See our display at the Southwest ASHRAE Show, Dallas, Feb. 1-4

AEROFIN CORPORATION

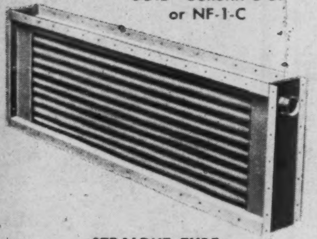
101 Greenway Avenue, Syracuse 3, N.Y.

Standardized Light-Weight Heat Exchanger Surface

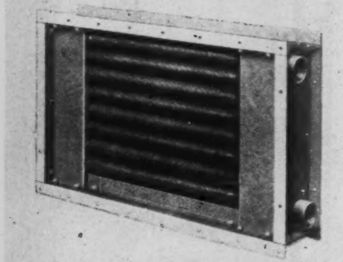
There is a factory-trained Aerofin application and service engineer located near you to give you prompt service. Write, wire or phone the factory.



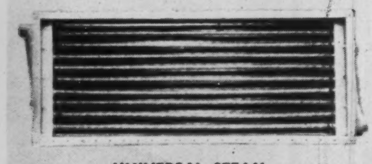
NON-FREEZE STEAM COIL Bulletin B-59 or NF-1-C



STRAIGHT TUBE BOOSTER STEAM COIL Bulletin H-45



HOT WATER BOOSTER COIL Bulletin HWB-58



UNIVERSAL STEAM COIL Bulletin H-45

Available in a wide range of sizes and types for heating, cooling, air conditioning and process, Aerofin is the modern standardized light-weight encased fan-system surface designed by *fan engineers* to meet present and future requirements of this highly specialized field.

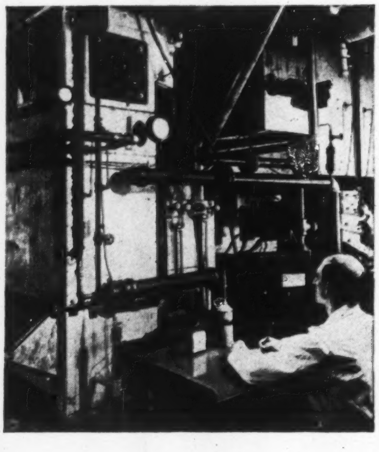
All standard Aerofin units are furnished as completely encased units, ready for pipe and duct connections. The patented casings are built of pressed steel and are exceptionally strong and rigid to protect the unit from all strains of pipe connections and expansion or contraction in service. The casings are flanged on both faces, top and bottom, and template-punched for bolting adjacent units together or for easy duct connection.

Guarantee

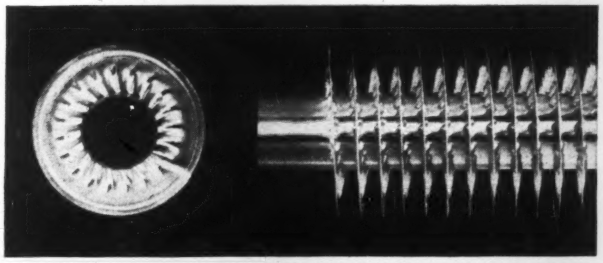
Aerofin is guaranteed, when properly installed and operated at pressures and temperatures not exceeding those specified, against failure or leakage due to faulty material or manufacture. The Aerofin Corporation will furnish a new unit, fob car Syracuse, N. Y., or Kingston, Ontario, for replacement of any unit found defective in either material or workmanship within one year from date of shipment of original unit, when such defective unit is returned to the factory at Syracuse, N. Y., or Kingston, Ontario.

Extended Surface Exclusively

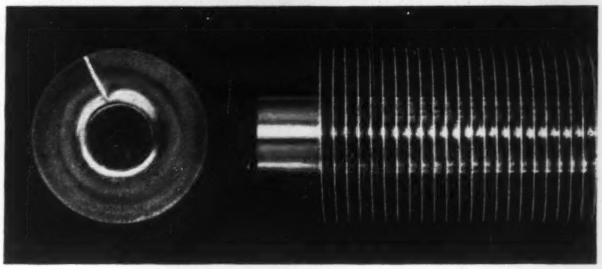
Aerofin manufactures light-weight extended-surface heat exchangers exclusively — not as a side line or accessory. Modern manufacturing, research and engineering facilities give real meaning to the Aerofin guarantee. Aerofin ratings are accurate — units may be safely installed to the full rated capacity.



Aerofin heat exchangers are rated according to accurate research laboratory test data and operate efficiently at full rated capacity.



Old Type
Aerofin Surface
with Crimped Fins



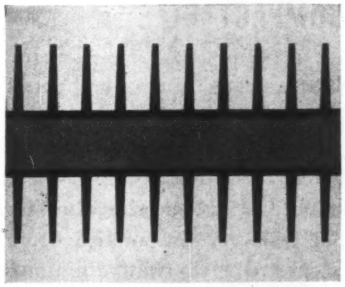
New Patented
Aerofin Surface
with Smooth Fins

Smooth-Fin Construction Provides Greater Capacity—Less Air Resistance

With air resistance and turbulence caused by the corrugations in the old-style fins now eliminated, note how many more fins can be used per inch of tube length. Note the extremely low air friction of this new design.

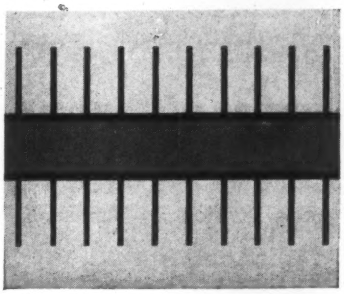
For optimum service, aluminum fins are spaced 14 fins per inch; copper, 12 fins per inch. Because of the low friction losses, high air velocities are entirely practical. This, combined with maximum heat transfer per sq ft of face area, results in extremely high heating or cooling capacity in relation to the available space.

For lower temperature differences, the tubes can be spaced on wider centers as required, or fewer rows may be used.



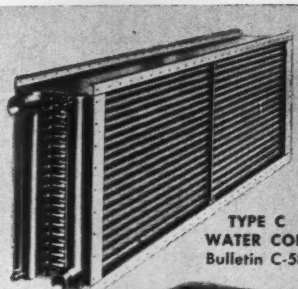
Aerofin Tapered Fin

The wide contact base of the new Aerofin tapered fin conducts sufficient heat between fin and tube to make the entire fin effective transfer surface. It is not necessary to crimp the fin to provide the required contact surface.

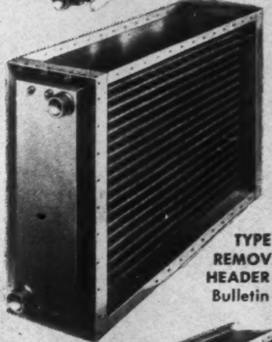


Conventional Straight Fin

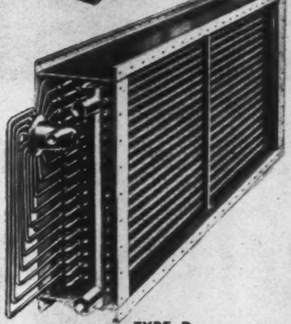
The relatively small amount of heat conducted by the small contact surface means that only a portion of the fin is effective heat transfer surface. Such fins are generally crimped to provide greater contact surface.



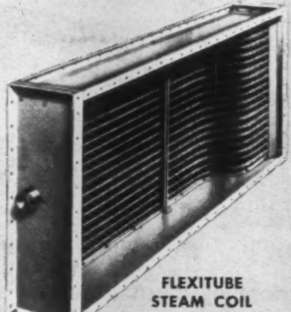
**TYPE C
WATER COIL**
Bulletin C-58



**TYPE B
REMOVABLE
HEADER COIL**
Bulletin R-50

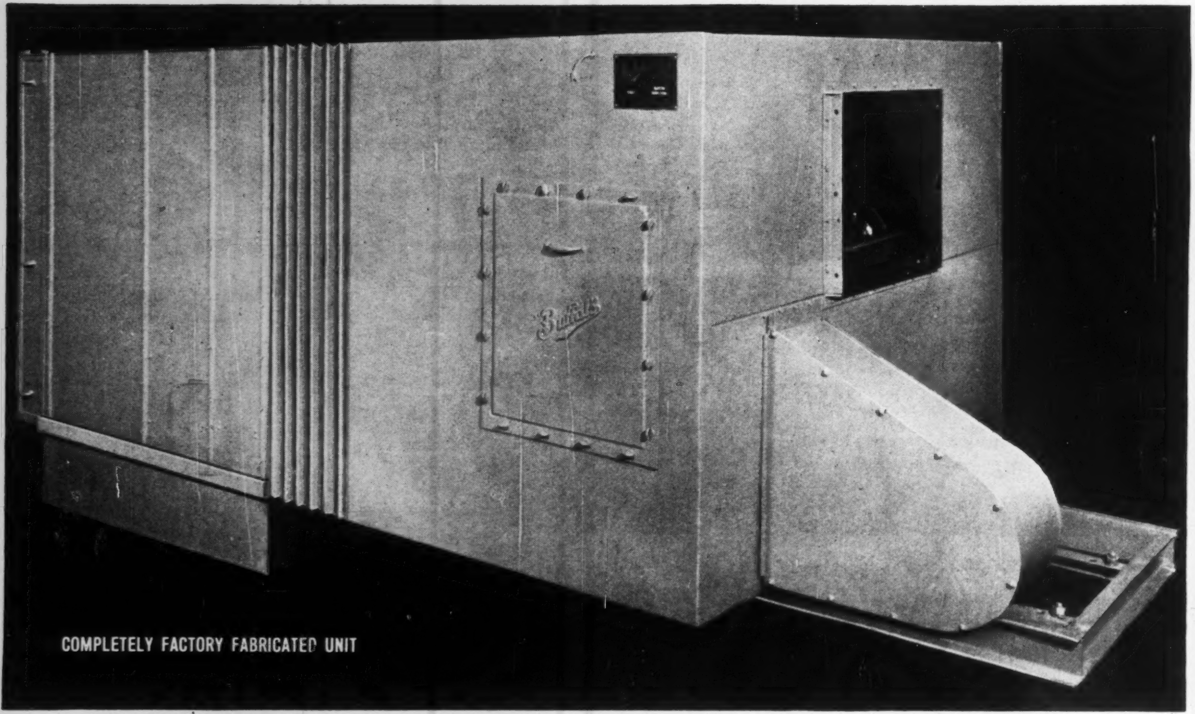


**TYPE D
DIRECT EXPANSION COIL**
Bulletin D-58



**FLEXITUBE
STEAM COIL**
Bulletin B-58

**HIGH PRESSURE STEAM
COIL** Bulletin H-45



NEW "BUFFALO" HIGH

INCREASED EFFICIENCY IN A MORE COMPACT SIZE

Here is a new high pressure (4″ to 8″ water gauge) air conditioning cabinet with many exclusive features. It is ideally suited to hospital operating rooms, laboratories and other high humidity installations.

Performing the functions of a standard central station cabinet, this new "Buffalo" unit also incorporates the washing, air cleaning, humidifying and evaporative cooling of an air washer.

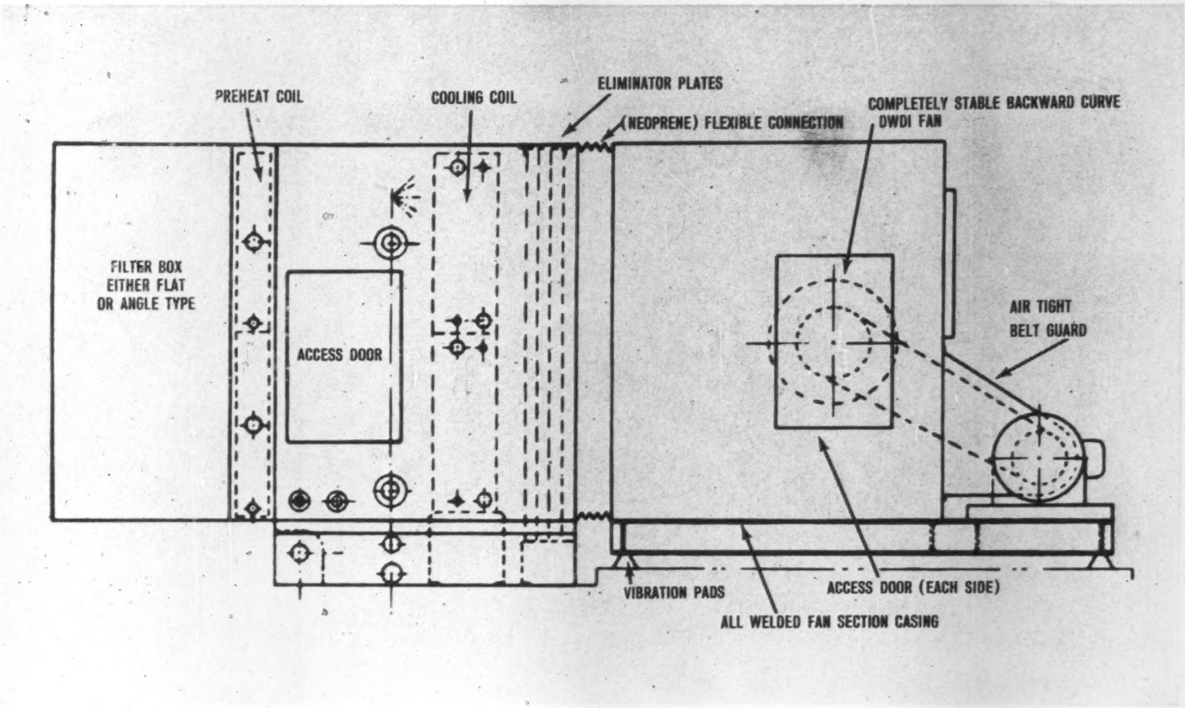
Water sprayed on the surface of the cooling coil permits the admission of a tremendous amount of moisture to the air stream. A high degree of saturation efficiency results so the air volume required for a given air conditioning load is reduced. **Thus, the size of cabinet, ducts and grills can be reduced.** Evaporative cooling produced by the recirculated spray water minimizes operation of mechanical refrigeration equipment during marginal weather.

"Buffalo"

BUFFALO FORGE

Buffalo Pumps Division Buffalo, N. Y.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT


PREHEAT COIL
COOLING COIL
ELIMINATOR PLATES
(NEOPRENE) FLEXIBLE CONNECTION
COMPLETELY STABLE BACKWARD CURVE DWDI FAN
FILTER BOX EITHER FLAT OR ANGLE TYPE
ACCESS DOOR
AIR TIGHT BELT GUARD
VIBRATION PADS
ACCESS DOOR (EACH SIDE)
ALL WELDED FAN SECTION CASING

PRESSURE AIR CONDITIONING CABINETS:

A COMPLETE PACKAGE...BUFFALO "Q" FACTOR CONSTRUCTION THROUGHOUT

QUALITY CONSTRUCTION AND DESIGN features of the fan section include an all-welded heavy gauge casing with 1″ internal insulation, completely stable backwardly curved double width, double inlet fan and special air-tight belt guard — all mounted on a common structural steel base. The washer section has a 12″ deep heavy gauge welded tank. Spray system includes all interior piping, nozzles, float and make-up valves and separate mounted "Buffalo" Close Coupled Pump. Coil section spacer accommodates Aerofin copper tube, spiral wound copper fin, solder coated cooling coil and 3-bend galvanized eliminator plates. Entrained moisture cannot carry over to fan section.

ACCESSORIES include face dampers for intake side of fan section or washer section, angle or flat type filter box for cleanable or throw-away filters. An exclusive matched sound attenuator is shown below. This attenuator is located after the fan section and can be provided with insulated transformation piece.

CONTACT your Buffalo Engineering Representative for further information or write direct for Bulletin AC-150.

COMPANY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

COOLING • HEATING • PRESSURE BLOWING

SMOOTH, "CUSHION" START

with new Century Electric part-winding start motor

This new motor . . . at either 1200 or 1800 rpm's . . . will give you smooth, "cushion" acceleration. No cogging, jerking or jarring equipment. No sub-synchronous stalling. Just dependable torque with the same 40% reduction in starting current of all Century Electric part-winding motors.

New winding—A special winding scheme makes this extra smooth start possible. Special cross connections are made between coil groups of the basic motor winding. Result: balanced stator field on first step position . . . no cogging . . . smooth acceleration. Means that now motors will give better performance on part-winding start. Also, more time can be taken for acceleration because the winding does not go "across the line" until the rotor has reached a higher speed.

Applications—Have an application where power company restrictions limit inrush current? The complete line of Century Electric part-winding start motors is the answer. They provide the most economical and dependable way of starting equipment with low-starting torque such as fans, blowers, centrifugal pumps, and compressors, as well as reciprocating compressors equipped with unloading valves. And with new Century Electric part-winding motors heavier loads than ever before can now be brought smoothly up to speed.

Construction—Century Electric part-winding start motors are available in approximate range of 20 to 150 hp sizes and in speeds of 1200 and 1800 rpm. They all have the high quality construction features of all Century Electric squirrel cage induction motors . . . coils are insulated with tough polyvinyl acetal resin . . . windings are dipped and baked with several coats of high temperature synthetic varnish which protect against oil fumes, mild acids and dust and grit . . . rotors are dynamically balanced so that motors run with extreme quietness and smoothness . . . rugged cast iron frame construction assures long life and low noise level.

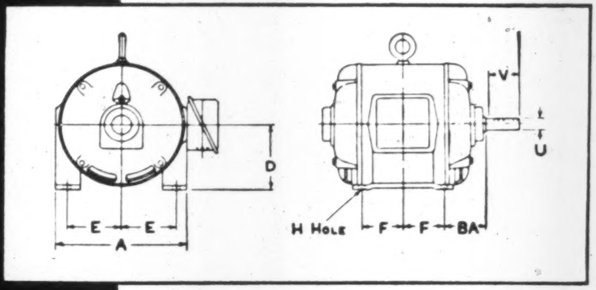
Application aid—A Century Electric application engineer will be glad to discuss your part-winding start problems with you. Century Electric also makes a complete line of motors . . . all sizes and types from 1/20 to 400 hp. For a copy of the new Century Electric Motor Application Guide, please write for bulletin 270A.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

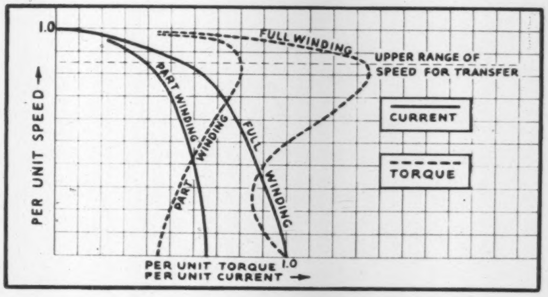
Century

59-10



TYPICAL 30 HP part-winding start motor dimensions

Frame Size	Key	A	BA	D	E	F	H	U	V
SC 326U	½ x ½	16	5¼	8	6¼	6	21/32	1⅞	5⅜



SPEED-TORQUE curves show how transfer to full winding can be made at higher speed after current has fallen off.

THE MARK OF QUALITY BARBER COLMAN

BARBER-COLMAN COMPANY

A1301 Rock Street, Rockford, Illinois

Field Offices in 95 Cities Throughout the United States and Canada — consult local phone book

A Complete Line of "Electrionic" Controls

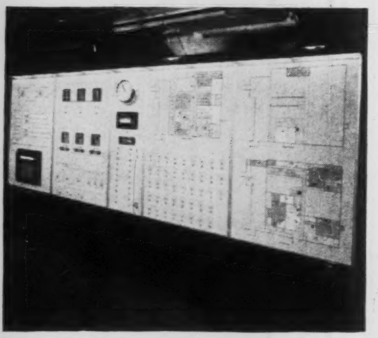
Barber-Colman manufactures a complete line of automatic temperature and humidity controls for commercial air conditioning, heating, ventilating, and industrial processing applications. Typical product lines are pictured on this page.

A nationwide sales and service organization offers experienced engineering assistance, qualified supervision of installation, and prompt, competent field maintenance assistance.

Only Barber-Colman offers you years of combined experience in both automatic controls and air distribution and assumes undivided responsibility for delivering ideal indoor weather.

Product literature and application diagrams available at your nearest Barber-Colman field office, or write to address above. Please state your specific interest.

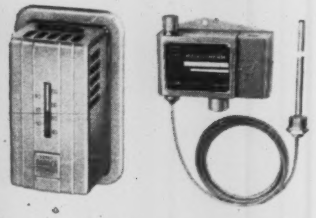
"Electrionic" Control Centers



"Electrionic" control centers provide visual supervision and remote readjustment of a building's entire air conditioning system and other mechanical and electrical systems from one central location. May include remote temperature indication and recording. Each "Electrionic" control center is custom-designed to meet the specifications of any commercial air conditioning or process control system.

Ask for booklet — "Electrionic" Control Centers.

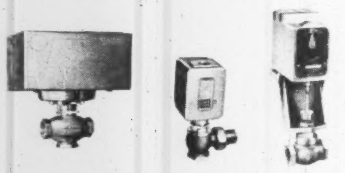
Temperature and Humidity Controls



Electric single- and two-position room and remote bulb thermostats for two-position or proportional control. Electronic room, duct, immersion, and outdoor temperature sensing elements in both fixed and adjustable settings. Hair element or electronic humidity controls for two-position or proportional control of motor-operated valves, compressors, relays, etc.

Motor-Operated Valves

(Including transistorized type)

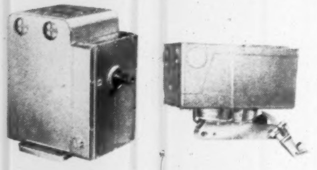


Single- or double-seated valves for on-off or modulating control of steam, air, and water, and three-way valves for bypass or mixing applications.

The complete line of compact motor operators includes two-position and proportional control models, as well as a transistorized electronic type for proportional control.

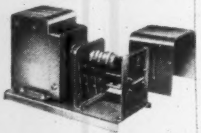
Motor Operators for Dampers, Air Valves

(Including transistorized type)



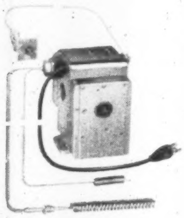
Oil-submerged electric spring return, unidirectional, reversible, multiposition and proportional motor operators for positioning dampers, air valves, etc. Adjustable speed optional. Also a transistorized electronic proportional model now available.

Sequence Controllers



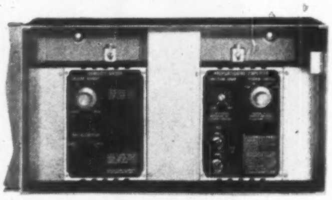
Sequence controllers, consisting of a reversible oil-submerged driving motor to operate from two to six snap-acting switches, are available for multistep control of compressors, pumps, valves, or relays in refrigeration, air conditioning, or industrial processing applications.

Unit Ventilator Controls



A complete line of controls for all types of unit ventilators, including face and bypass, valve-controlled, electrically heated, and direct gas-fired classroom or auditorium types. "Package" sets are featured, designed for mounting entirely within the unit ventilator enclosure. These sets utilize a dual-element thermostat combined with a motor operator for extremely accurate control of room and discharge air temperatures without the need for wall-mounted room thermostats.

Modular Electronic Controls



These controls translate temperature or humidity changes into voltage outputs which are amplified to operate relays. The relays, in turn, operate valves, motor operators, or other control devices.

Complete custom control panels to meet any requirement are built up of one or more standard bridge circuit modules and one or more standard amplifier modules.

Temperature bridges provide for use of one, two, or three standard sensing elements. Auxiliary bridge circuit modules are available to operate as many as three amplifiers in sequence. Either two-position or proportional amplifiers are available.

Dual compensator units, used with an amplifier module or combination of amplifier and bridge components, provide control for such applications as: outdoor reset of main element, stabilization of discharge temperature, differential thermostat action, and lag element control.

Accessories

The Barber-Colman accessory line includes power boxes, transformers, color-coded thermostat cable, relays, switches, electric time switches, manual rheostats, polarized microrelays, and other items which go to make up a complete control system.

THE MARK OF QUALITY

BARBER-COLMAN COMPANY

A1101 Rock Street, Rockford, Illinois

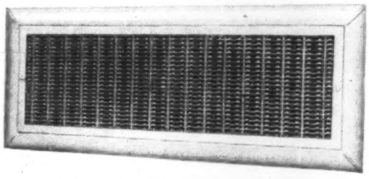
Field Offices in 95 Cities Throughout the United States
and Canada — consult local phone book

A Complete Line of Engineered Air Distribution Products

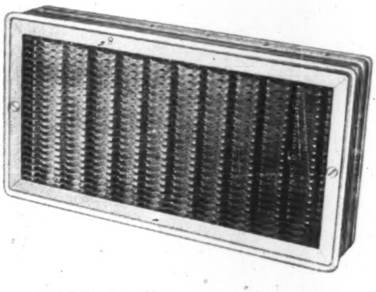
Barber-Colman offers you years of combined experience in both air distribution products and automatic controls to help you develop the correct relationship between room temperature, velocity of air being introduced to the room, and temperature of the moving air in relationship to average air temperature in the room. You are assured correct, complaint-free human comfort conditions because Barber-Colman guarantees the performance of its products.

Complete descriptive literature and selection data available upon request.

Sidewall Diffusers



MODEL MA (has removable core)



MODEL FA (has removable core)

Model ST, STW, and STWA continuous diffusers for under-the-window, sidewall, and floor use.

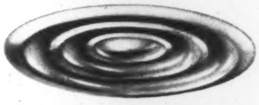
Uni-Flo diffusers provide rapid mixing, a high rate of aspiration with resultant high entrainment ratio, low pressure drop, low noise level, simple adjustment in the air pattern, and a pleasing appearance. A variety of frame styles is available to meet sidewall, panel, or exposed duct installation requirements. The removable core feature makes it unnecessary to break the paint or plaster seal for cleaning or decorating purposes.

Barber-Colman also manufactures a complete line of return, exhaust, and transfer grilles, including the Sight-Tite core for use in doors to provide adequate ventilation without "see-through."

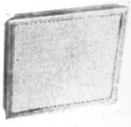
Accessories

Barber-Colman accessories include opposed-blade volume controls — Voladjusters for remote manual adjustment of air volume — Airturns and Deflectrols, for efficient flow of air around turns and into take-offs.

Ceiling Diffusers

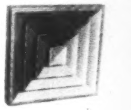


Venturi-Flo ceiling diffusers feature quiet operation, rigid construction, wide range of sizes, efficient diffusion, adjustable deflection volume control, and attractive appearance. They are available for supply and return service in both recessed and flush mounting styles. A complete line of accessories includes volume controls, dampers, and Deflectrols.



Uni-Flo square and rectangular ceiling diffusers with the original perforated diffuser plate.

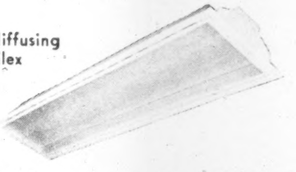
Square and rectangular ceiling diffusers with attractively designed faceplates are available in both recessed and surface models. Air pattern modification and volume control are provided without altering appearance.



Uni-Flo square and rectangular diffusers with louver face design.

Square and rectangular diffusers are also available with a louver face design to meet specific architectural requirements. These are available with a variety of vane assemblies to provide 4-way, 3-way, 2-way, or 1-way air patterns.

Combination Air Distribution and Lighting Units

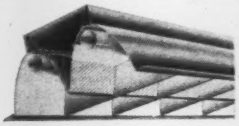


Air diffusing Mobilex

The Mobilex is an enclosed light troffer combining an air distribution diffuser (1′ x 2′, or 2′ x 4′ sizes) with two, three, or four fluorescent tubes.

The Paraflo (upper right) is a louver-type troffer.

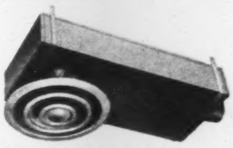
Air distribution assembly by Barber-Colman, lighting by Day-Brite Lighting, Inc.



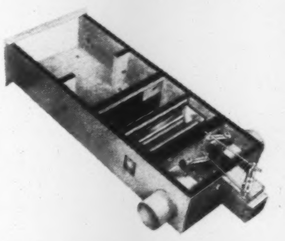
Paraflo combination air distribution and lighting unit.

High Velocity Units

High velocity air distribution, pioneered by Barber-Colman, requires technically designed units which will reduce the high velocity air to conventional velocities and correctly distribute it to the occupancy zones at minimum noise levels. Barber-Colman offers a complete line of single- and double-duct control equipment, including constant volume control.

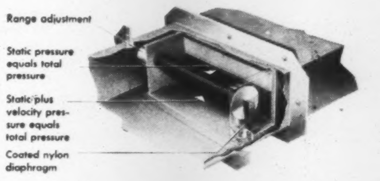


Barber-Colman high velocity control unit with Venturi-Flo diffuser.



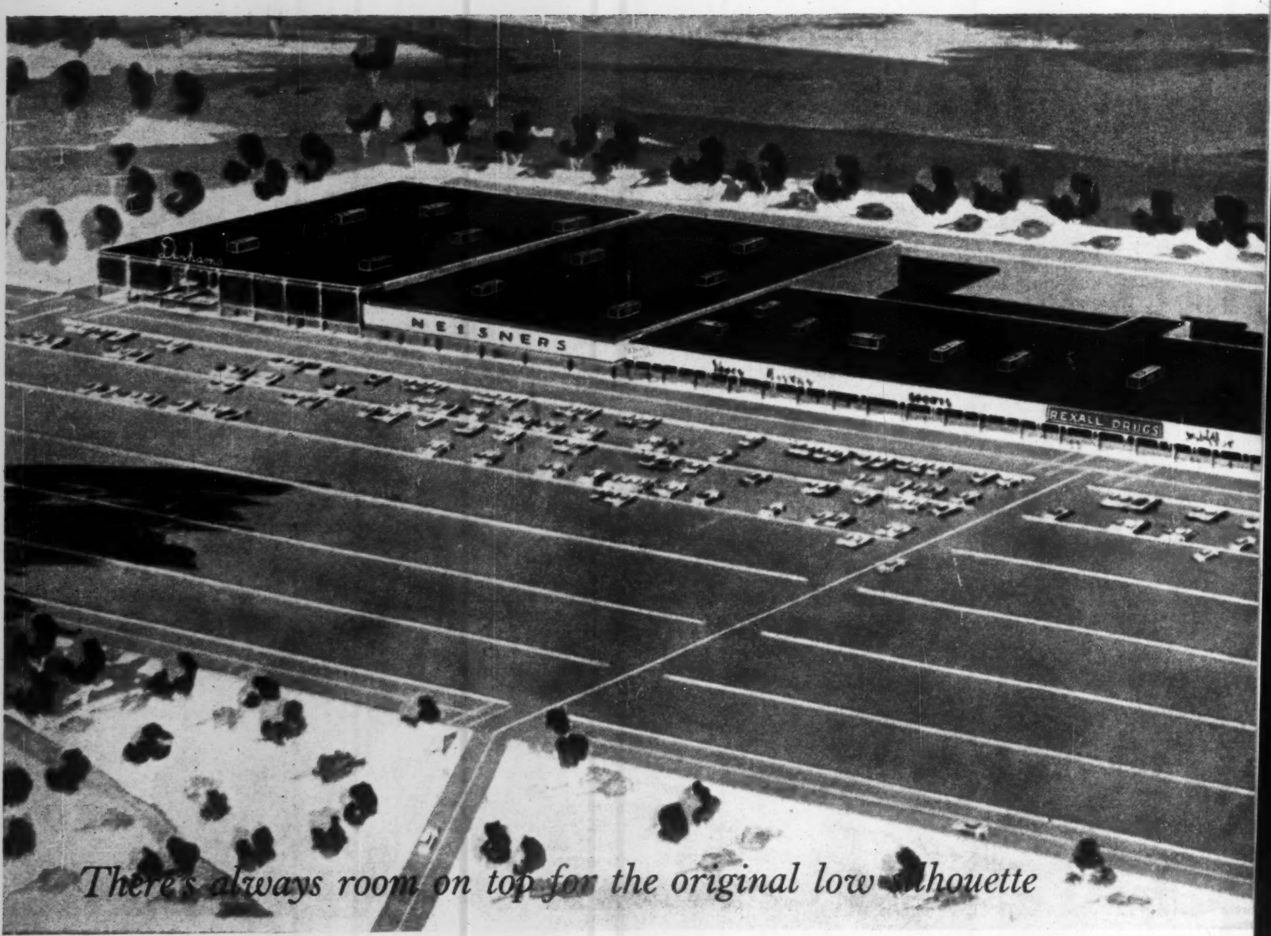
Uni-Flo double-duct constant volume control

The Uni-Flo double-duct control unit with self-contained constant volume control simplifies stabilization of high velocity systems. It mixes hot and cold air and reduces it to conventional velocity at minimum noise level. Cfm delivery and air mixture temperatures are held within very close limits. A choice of motor operators is available to control the air valves, including Barber-Colman electric and transistorized types.


Range adjustment
Static pressure equals total pressure
Static plus velocity pressure equals total pressure
Coated nylon diaphragm

Model SCR constant volume regulator

The Model SCR constant volume regulator is applicable anywhere in a single- or double-duct system where there are changes in static pressure. No motor operator or other power source is required. It provides accurate constant volume control, reducing high velocities for branch ducts.


NEISNERS
REXALL DRUGS
There's always room on top for the original low silhouette

THE

ATMOS-PAK

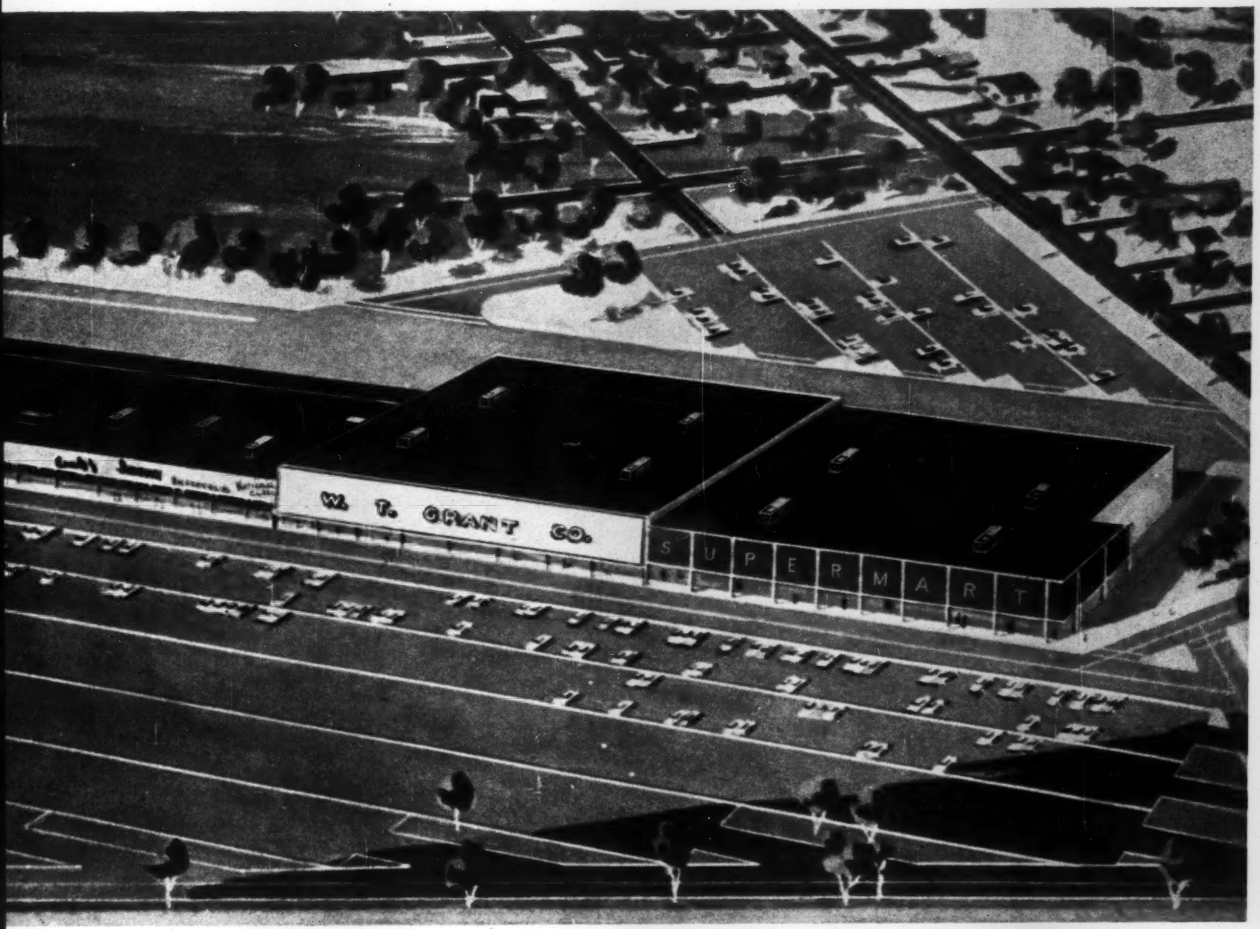
- *designed for low cost year-round air conditioning*
- *roof-mounted for more interior design freedom*
- *pre-fabricated for quick installation*

We list our exclusive features as proof that for any application involving one story structures — whether shopping centers, industrial plants, supermarkets, churches and synagogues, bowling alleys or post offices — our unit is the finest.

Year-round Unit
15 & 20 ton units constructed in one section
30 & 35 ton units constructed in two sections

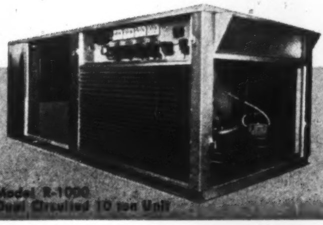
5, 7½ & 10 ton
Single Circuited Unit

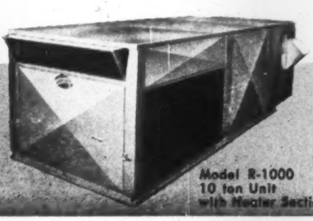
10, 15 & 20 ton Year-round Unit
Constructed in one section



Trenton Lane Shopping Center, Trenton, New Jersey
General Contractor — J. C. Breyfogle
Architects — Milosevich and Trautwein
Developers & Managing Agents — Garfield Associates

FEATURES	THE ATMOS-PAK	UNIT A	UNIT B	UNIT C	UNIT D	UNIT E
Mechanical Chimney	Yes	No	No	No	No	No
Individually Fused Motor Circuit	Yes	No	Yes	No	No	No
All Blowers of the Centrifugal Type	Yes	No	Yes	No	No	Yes
All Components Completely Protected from the Elements	Yes	No	No	No	No	Yes
Preformed Continuous Refrigerant Piping Circuits	Yes	No	No	No	No	No
Supply and Return Air Distribution Chamber with Controlled Air Pattern	Yes	No	No	No	No	No
Permanent Lubrication	Yes	No	No	No	No	No
No Field Assembly Required	Yes	Yes	Yes	No	No	No
Internal Service Switch	Yes	No	Yes	No	No	No
Automatic Condenser Air Discharge Hood	Yes	No	No	No	No	No
Distribution Chamber Adaptable to Duct Work	Yes	No	Yes	No	No	No
Universal Heater Section	Yes	No	No	No	No	No
Complete Line of Units 5 through 35 tons	Yes	No	No	No	No	No


Model R-1000
Dual Circuited 10 ton Unit


Model R-1000
10 ton Unit
with Heater Section

designed, manufactured, installed and PIONEERED by
AIR CONDITIONING, INCORPORATED
88 North Highland Avenue
Ossining, New York

® patented **the atmos-pak**

MUNDET

Choose the BEST for Your Purpose...

MUNDET ENGINEERED INSULATIONS Include:

85% MAGNESIA

Mundet "Custom-Molded" 85% Magnesia is available in board and pipe covering. 85% Magnesia is the standard for highest efficiency on temperatures up to 550°F; assures low conductivity; is stable and easily applied. One of the best known insulations for industrial needs for half a century. For temperatures above 550°F, use Mundet "Tri-calite" insulation.

GLASS FIBER

Mundet glass fiber products include Superfine Glass Fiber blanket insulation, Superglas pipe insulation with patented "hinge action," and Supertex Glass Fiber duct liner. This modern low-density insulation is recommended where maximum thermal and acoustical efficiency is required for minimum space, on applications up to 350°F. Easily handled, clean and sanitary.

POLYSTYRENE

Mundet Expanded Polystyrene Board and Pipe Covering provide extremely low conductivity; highest resistance to vapor transmission and moisture absorption. This material has exceptional compressive strength; is odorless, lightweight and durable. Manufacturing control assures precision fit. Applications include refrigerant piping, duct work and cold storage rooms.

CORK

From sub-zero to +35°F, Mundet Cork insulation offers the "heavy-duty" protection that has never been surpassed. Mundet Corkboard and Cork Pipe Covering are fabricated from 100% pure Cork to the most exacting specifications . . . is the highest grade cork insulation obtainable. Recommended for all low temperature applications on its record of proved use.

Write for free Data Bulletins on any of our products. In addition to a full line of insulating materials Mundet provides expert contract installation services through our branch offices or through Mundet distributor-applicators located in most industrial areas. If you are interested in controlled temperatures at lowest cost and minimum maintenance, call on us now.

MUNDET CORK CORPORATION

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339-41 Elizabeth St. N. E.
CHICAGO
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CINCINNATI 25
3118-24 Spring Grove Ave.

DETROIT 38
14401 Prairie Ave.
HOUSTON 11
6601 Supply Row
JACKSONVILLE 2, FLA.
514 E. Bay St.

LOS ANGELES
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PORTLAND, ORE.
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Specify
ELLICOTT
Hot Water
Generators
WITH CUSTOMIZED CORROSION CONTROL

Ellicott offers a complete range of metals and linings customized to control most types of corrosion in Hot Water Generators.

COPPER SILICON—offers outstanding resistance to corrosion under practically all conditions.

STAINLESS CLADS—stainless and steel inseparably bonded together for lifetime service under specific conditions.

COPPER LINED—linings of sheet copper inside the shell of a steel tank give all the advantages of copper and the strength of steel.

ALUMINUM AND ALUMINUM ALLOYS—can now be successfully used where other materials have failed.

BAKED ON PLASTIC LININGS—homogenous coating of baked-on plastic linings is low in cost yet offers outstanding protection against corrosion.

CEMENT LININGS—special water resistant hydraulic cement and silica composition helps prevent rusty water.

GALVANIZED—hot dipped galvanizing of hot water generators is recommended where corrosion problems are minor.

Let Ellicott save you money by recommending the type of material most suitable to your needs. Representatives in major cities.

ELLICOTT
FABRICATORS INC.

Hot Water Generators
Heat Exchangers
Storage Tanks
Special Lining
Special Fabrication

Subsidiary of Ellicott Machine Corporation
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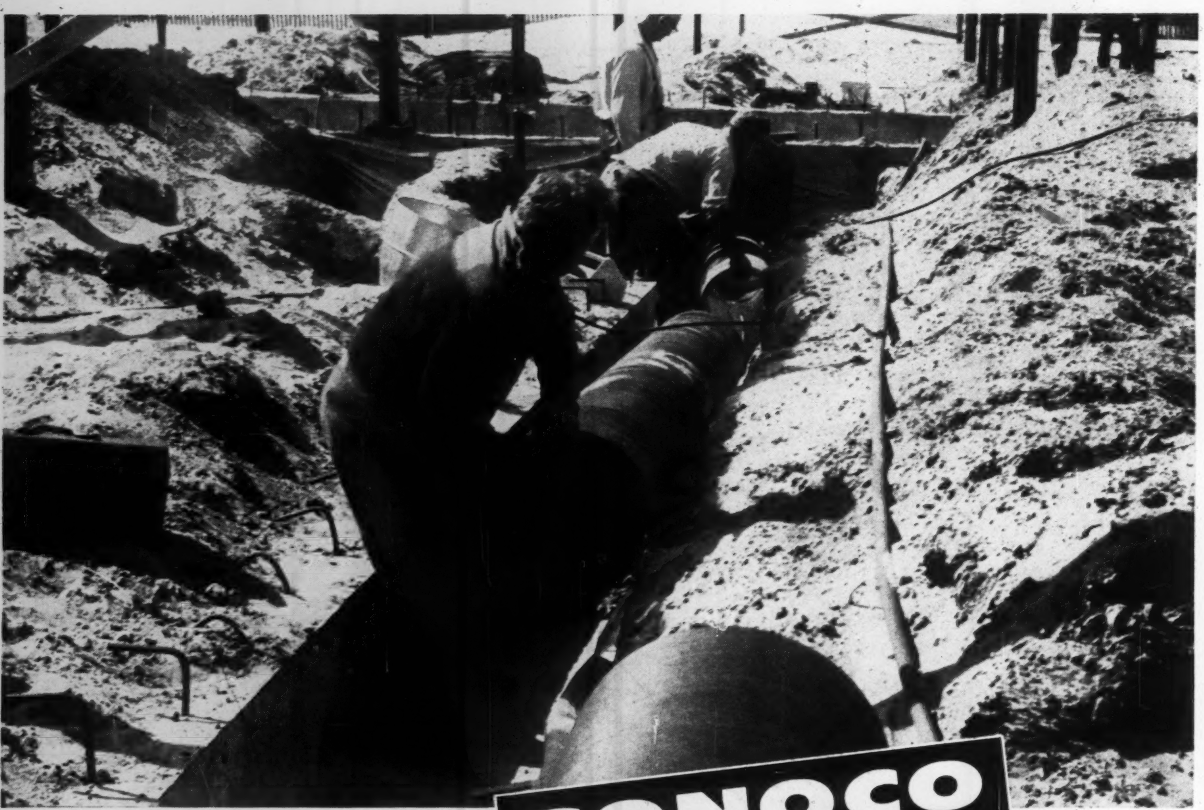


Pulaski Elementary School, Gary, Indiana. Architect: Caudill, Rowlett, Scott & Associates. General Contractor: Taylor & Taylor. Heating Contractor: Quality Heating & Air Conditioning Company

SONOCO

SONOAIRDUCT®

FIBRE DUCT

Again in '59 more SONOCO SONOAIRDUCT FIBRE DUCT **was installed than ever before!**

FREE INSTALLATION MANUAL

contains latest, detailed, step-by-step installation data for SONOAIRDUCT Fibre Duct. For free copy, send us your name and address on company letterhead.

The original fibre duct, especially constructed for use in slab perimeter heating systems, continues to be a best seller! The reason? Because the installation of SONOAIRDUCT Fibre Duct saves time, labor, and money . . . and performance has proved its dependability!

Use in commercial, institutional, and industrial buildings, as well as in residential jobs. Low-cost SONOAIRDUCT Fibre Duct handles easier and levels quicker than any other kind of duct . . . comes in long lengths, has no sharp cutting edges, and won't chip, crack, or break when dropped—every piece is usable!

Available in 23 sizes, 2″ to 36″ I.D., in standard 18′ shipping lengths—special sizes to order. Cut to exact size with hand saw. SONOAIRDUCT Fibre Duct meets or exceeds F.H.A. criteria and test requirements for products in this category.

See our catalog in Sweet's, or write for complete information and prices to

- HARTSVILLE, S.C.
- LA PUENTE, CALIF.
- FREMONT, CALIF.
- MONTCLAIR, N.J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D.F.

SONOCO

Construction Products

SONOCO PRODUCTS COMPANY

4489

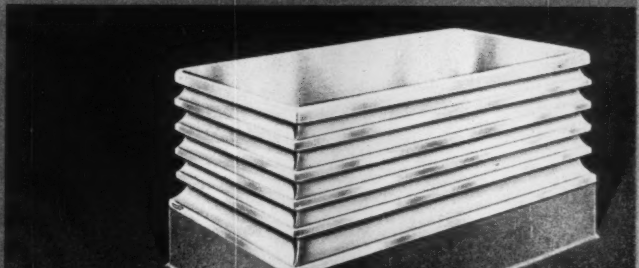
Write For
CATALOG EAG 7-59

TITUS

TITUS
EAGle Line
EXTRUDED ALUMINUM GRILLES

extruded aluminum

- GRILLES & REGISTERS
- MATCHED LINEAR DIFFUSERS
- OUTSIDE LOUVERS & LOUVER PENTHOUSES



TITUS MFG. CORP. WATERLOO, IOWA
Miami, Florida

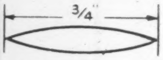
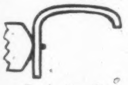
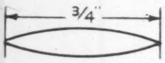
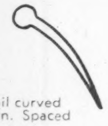
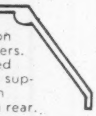
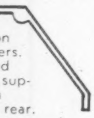
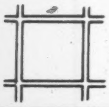
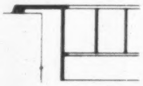
TITUS

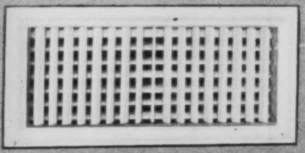
EXTRUDED ALUMINUM supply and return grilles and registers

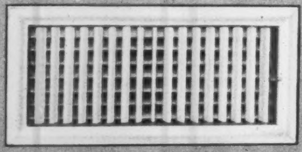
DESIGN:
Finest quality aluminum extrusions from Titus' own extrusion presses. Mitered joints, heliarc welded.

SIZES:
All standard sizes. Any width or length on special order.

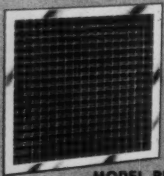
FINISHES:
Furnished as standard with exclusive Titus ETCHED SATIN FINISH. Anodizing in any color on request.

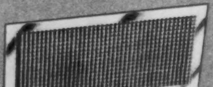
MODEL	DESCRIPTION	LOUVER DESIGN	BORDER	DAMPER
SIDEWALL SUPPLY GRILLES				
CL-270	Two sets louvers. Front set parallel long dimension. Rear parallel short dimension. Individually adjustable. 4-way air control—right, left, up, down.	 Airfoil. Solid section. Spaced 3/4" centers.	 Exclusive Titus curved design.	None
CS-270	Same as above except front louvers parallel short dimension. Rear set parallel long dimension. (PICTURED BELOW).			None
SIDEWALL SUPPLY REGISTERS				
CL-274	One set individually adjustable louvers parallel long dimension. 2-way directional control—up or down.	 Airfoil. Solid section. Spaced 3/4" centers.	Same as above.	Multi-shutter . . . spaced on 1" centers. Standard lever operator.
CS-274	Same as above except front louvers parallel short dimension. (PICTURED BELOW).			Same as above.
CL-277	Two sets individually adjustable louvers. Front set parallel long dimension. Second set parallel short dimension.			Opposed blade damper with removable Allen wrench operator.
CS-277	Same as above except front set louvers parallel short dimension, second set long dimension.			Same as above.
CEILING & SIDEWALL GRILLES				
CL-201	One set individually adjustable louvers parallel long dimension. 1-way directional air control. (PICTURED BELOW).	 Airfoil curved design. Spaced 3/4" centers.	Same as above.	Choice of 3 types dampers: (1) Rear set individually adjustable louvers. (Specify with numeral **"3"**. Example CL-2013. (2) Multi-shutter damper. (Specify with numeral **"4"**. Example: CL-2014). (3) Opposed blade damper. (Specify with numeral **"5"**. Example: CL-2015).
CS-201	One set individually adjustable louvers parallel short dimension. 1-way directional air control.			
CL-202	One set individually adjustable louvers parallel long dimension. 2-way directional control—up and down. (PICTURED BELOW).			
CS-202	One set individually adjustable louvers parallel short dimension.			
SIDEWALL RETURN AIR GRILLES				
CRL-230	One set of louvers parallel to long dimension and fixed at 45° deflection. (PICTURED BELOW).	 Spaced on 3/4" centers. Concealed channels support each louver in rear.	Same as above.	None
CRS-230	Same as above except features louvers running parallel to short dimension.			None
SIDEWALL RETURN AIR REGISTERS				
CRL-241	Return air grille with opposed acting damper. Front set of louvers fixed at 45° and parallel to long dimension.	 Spaced on 3/4" centers. Concealed channels support each louver in rear.	Same as above.	Opposed blade damper with removable Allen wrench operator.
CRS-241	Same as above except front set of louvers parallel to short dimension.			Same as above.
LOUVERED RETURN AIR GRILLES				
RH-50	For ceilings. Extruded aluminum border, fixed heavy-duty 1/2" x 1/2" x 1/2" fabricated aluminum louvers.			Straightening vanes, opposed blade and multi-shutter dampers.
RH-100	For sidewall. Extruded aluminum border, fixed heavy-duty 1" x 1" x 1" fabricated aluminum louvers.			

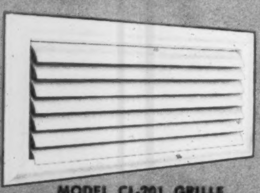

MODEL CS-270 GRILLE

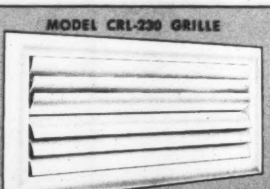

MODEL CS-274 REGISTER

MODEL CRL-230 GRILLE


MODEL RH-50 GRILLE


MODEL RH-100 GRILLE


MODEL CL-201 GRILLE


MODEL CL-202 GRILLE

TITUS

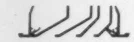
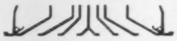
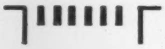
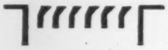
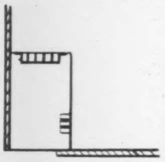
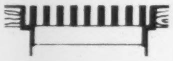
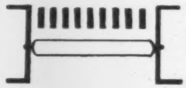
EXTRUDED ALUMINUM matched linear air diffusing grilles

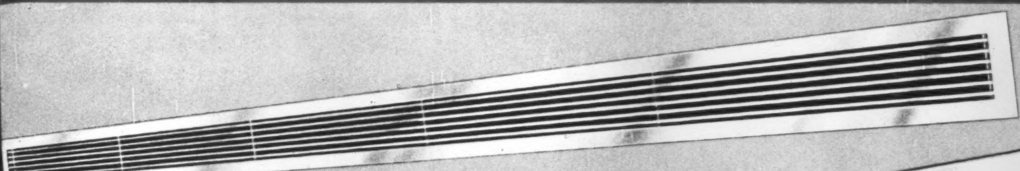
DESIGN:
Finest quality aluminum extrusions from Titus' own extrusion presses. Mitered joints — heliarc welded. Sections butt without break.

DAMPERS:
Available with straightening vanes, multi-shutter or opposed blade dampers.

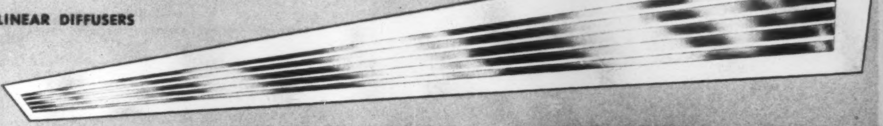
FINISHES:
Brushed satin as standard. Also available etched with clear lacquer finish or clear Duracron baked finish.

***ENGINEERING DATA:**
See engineering data section, Titus Linear Diffuser Bulletin LTD-1-58.

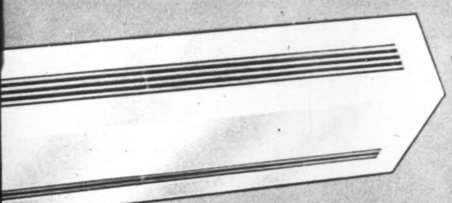
MODEL	APPLICATION	DESCRIPTION	EXTRUDED DESIGN	SIZES
SLIM-LINE DIFFUSERS				
C-2700	Primarily for supply and return in all types of ceilings — but can also be used on sidewall. Use in continuous runs. (PICTURED BELOW).	Fixed louvers provide 1-way air deflection. Removable core feature. Special recessed frame for plaster mounting.		3½" and 6½" widths in any length.
C-2800	Same as above except recommended for ceiling applications only.	Same as above except fixed louvers provide 2-way air deflection.		6¼" and 12¼" widths in any length.
LINEAR AIR DIFFUSERS				
*C-2500	Primarily for continuous line use in sidewalls, window sills, etc. — but can also be used in ceilings. Supply or return. (PICTURED BELOW).	Louvers parallel to long dimension and fixed at 0° deflection. Spaced on ½" centers. Borders in many sizes.		1½", 2", 2½", 3" and 4" widths in any length.
*C-2615	Same as above.	Same as above except louvers fixed at 15° deflection.		Same as above.
LINEAR CONVECTOR ENCLOSURES				
*C-3100	For enclosing convectors, radiators, air-conditioning and ventilating units. (PICTURED BELOW).	Cover of heavy-gauge aluminum with grille faces in top and side as specified. Heavy-duty, tamper-proof louvers fixed at 0° deflection. Spaced on ½" centers.		Variable heights, widths, lengths as specified.
*C-3115	Same as above.	Same as above except louvers fixed at 15° deflection.		Same as above.
LINEAR FLOOR GRILLES				
*C-3000	All types of floors in banks, schools, hospitals, motels, etc. Supply and return. (PICTURED BELOW).	Grille has removable face. Lift out grille face — install frame in floor. When floor is finished, simply slip grille face back into frame.		1½", 2", 2½", 3", 3½", and 4" widths.
LINEAR SECURITY GRILLES				
*C-3200	Sidewall supply and return in security wards of psychiatric hospitals, correctional institutions, etc. (PICTURED BELOW).	Heavy-gauge aluminum. Builds into, becomes integral part of concrete block or brick wall construction. Heavy-duty tamper-proof louvers spaced on ½" centers. Fixed at 0° or 15° deflection.		4" depth for brick, 8" depth for concrete block. Any height or width.



MODEL C 2500 LINEAR DIFFUSERS

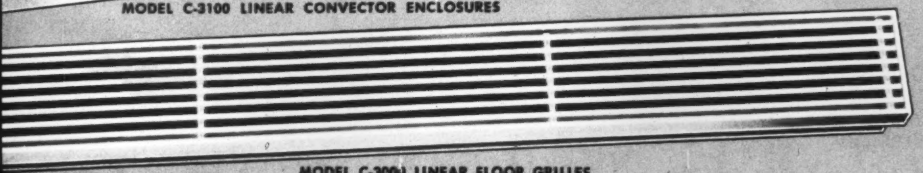


MODEL C-2700 SLIM-LINE DIFFUSERS



MODEL C-3100 LINEAR CONVECTOR ENCLOSURES

MODEL C-3200 LINEAR SECURITY GRILLES



MODEL C-3000 LINEAR FLOOR GRILLES

TITUS

EXTRUDED ALUMINUM outside louvers and louver penthouses

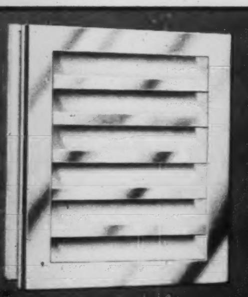
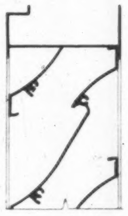
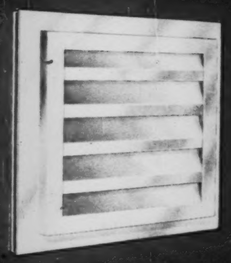
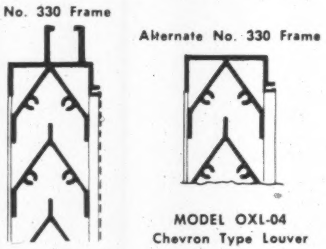
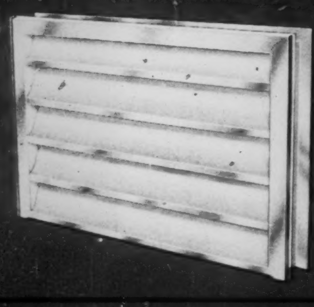
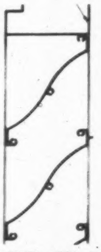
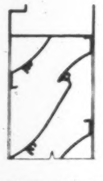
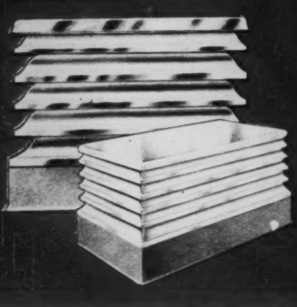
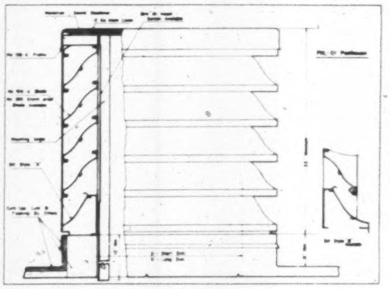
DESIGN: Combine the finest in simplified, modern, architectural design with maximum free area (APPROX. 50%) and excellent weatherproof characteristics.

MATERIAL: Extruded aluminum sections, 12-gauge in thickness, 6063-T5 alloy. Heliarc welded joints.

SIZES: Any size specified.

FINISHES: Standard Mill Finish with clear butyrate lacquer protective coating — unless otherwise specified.

SCREENS: Aluminum bird and bug screens to fit on back or exterior face of louver. 16 mesh, 4 mesh, 2 mesh.

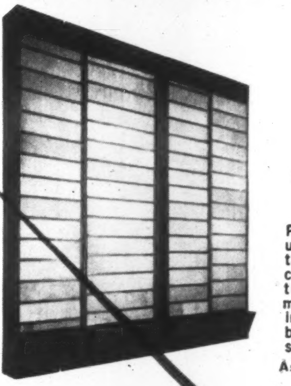
	SIZE	APPLICATION	EXTRUDED DESIGN
	**1½" louver** (stationary type)	Ideal stormproof louver for outside air intake or air exhaust use in all types of commercial, institutional, industrial applications. Use in standard or jumbo brick, concrete or cinder block construction.	 **MODEL OXL-03** Stormproof Outside Louvers
	**2" louver** (stationary type)	Any exterior wall opening where continuous flow of supply or exhaust air desired. Use in standard and jumbo brick, concrete or cinder block construction.	 **MODEL OXL-04** Chevron Type Louver
	**4" louver** (stationary type)	Use in any exterior wall opening where a continuous flow of supply or exhaust air desired. Install in any type wall construction. Available in a wide variety of blade and louver types. Contact factory for complete information.	 **MODEL OXL-01** Weatherproof Louver  **MODEL OXL-02** Stormproof Louver
	**Penthouses — any size — square or rectangular**	Air intake or exhaust unit for handling ventilation through the roof. Louvers extend continuously on all 4 sides. Roof of one-piece 12-gauge sheet aluminum. All-aluminum design practically eliminates maintenance as no frequent paintings or protective coatings are needed.	 **MODEL PXL-01 Penthouse**

TITUS MFG. CORP., Waterloo, Iowa

Litho In U.S.A.

'round the world . . .

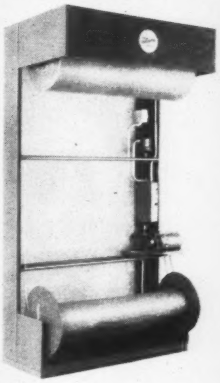
CONTINENTAL *clears the air*



SELF-CLEANING AUTOMATICS

Patented media design and unique "soak-then-flush" action provide thorough self-cleaning. Ferris-wheel feature eliminates reversing media to direction of air flow in back curtain—no dust can be blown back into clean air stream.

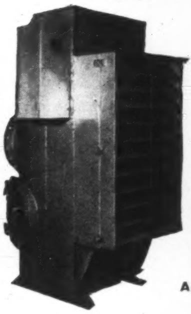
Ask for catalog #210



CONOMATIC
ROLL-AWAY TYPE

Automatically controlled, clears air at lowest cost per cubic foot of any filter in its classification. Dependable automatic performance with minimum of maintenance attention.

Ask for catalog #802



HEAVY DUTY ENGINE AIR INTAKES

All advantages of Continental's Self-Cleaning Automatics assure maximum protection with minimum maintenance cost and effort.

Ask for catalog #100

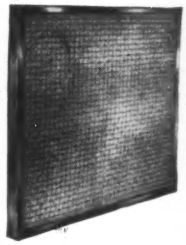
CONOMANUAL
hand-operated

A roll-away, synthetic media, viscous impingement filter . . . hand-operated to combine maximum economy with roll-away convenience.

Ask for catalog #850

AIR
CONTINENTAL
FILTERS

TYPE DY DYCON



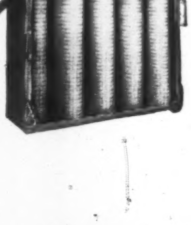
Permanent 1" synthetic fiber filter in rust-proof aluminum frame easily rinses clean under open water faucet or nozzleless hose. Exceptional dust-holding capacity means infrequent servicing. Made in any desired size.

Ask for catalog #5

E-Z-WASH UNIT FILTERS

Continental's patented media assures high efficiency, easy washing, freedom from clogging, and exceptional dust-holding capacity.

Ask for catalog #423



DYCON
CA-20, CA-24

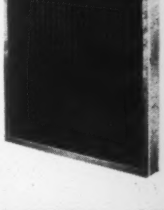
Oil-free, synthetic media of these extended-surface unit filters effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use — cuts maintenance costs.

Ask for catalog #450

TYPE LV SCREEN WIRE

Graduated mesh-size in this formed screen wire filter adds efficiency and dust-holding capacity. Viscous impingement, low velocity type. Available in 2- or 4-inch thickness, all standard sizes. Special sizes on order.

Ask for catalog #600



For simple finger-tip re-oiling of viscous-type unit filters after washing . . .

E-Z-OIL AEROSOL BOMB

E-Z Oil
Air Filter Oil

E-Z-WASH GREASE FILTERS

All aluminum highly efficient, permanent-type filters for kitchen exhaust systems. Easily washed — once through an automatic dish washer and they are like new again.

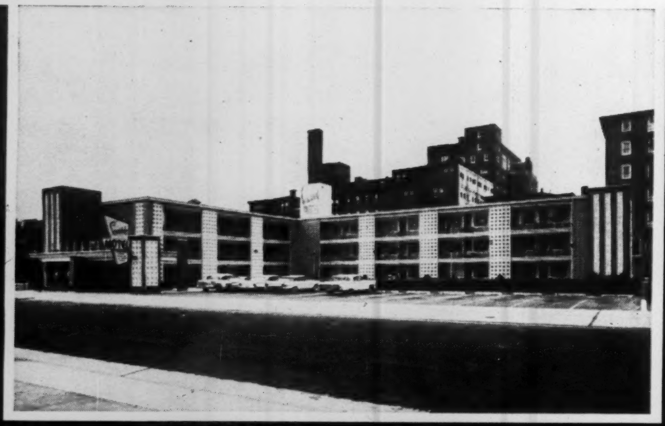
Ask for catalog #700

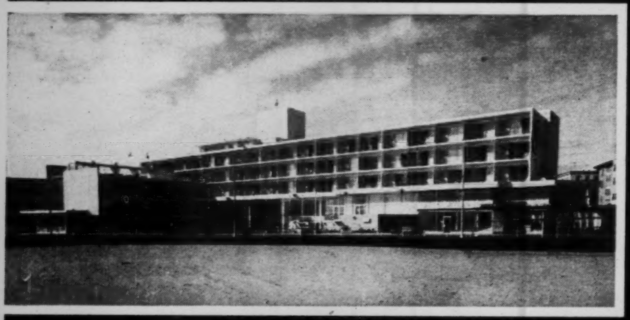
CONTINENTAL AIR FILTERS, Inc.

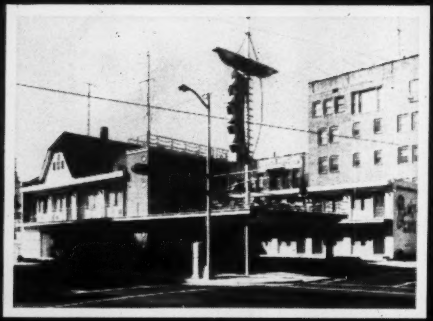
P. O. Box 1647, Louisville 1, Kentucky

REFER to catalog in Sweet's Architectural File, or CONTACT the Continental Sales representative in your city, or WRITE direct for catalogs, estimates, other information.

Acme . . . the **practical** approach to





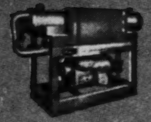


Acme is the word for air conditioning

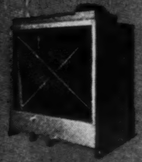
Here you see a representation of just a few of the many fine motels in and around Atlantic City that feature Acme air conditioning equipment. Fact is, in Atlantic City alone there are 25 quality motels so equipped and on the several turnpikes leading into the City you'll find at least 25 more . . . ranging in size from 25 units to more than 250 and in value from a quarter of a million to almost two million dollars. And in every one of these motels the "heart" of the year 'round comfort conditioning systems, the chillers and the cooling towers, bear the name Acme . . . the name that has been synonymous with quality and dependability in air conditioning and refrigeration equipment since 1919. Yes, "the word" for air conditioning in Atlantic City motels is *definitely* Acme.

Why Acme? Well, the architects and engineers who recommended Acme, the contractors who installed the equipment, the motel owners who are using it could tell you best. But the answer is readily available simply by "adding up" some of the advantages of Acme equipment . . . space-saving, cost-reducing compactness . . . easy to install, factory-assembled "packaging" . . . smooth, quiet, efficient operation . . . minimum-maintenance simplicity and ruggedness . . . convenient, protected controls . . . factory tested and certified performance reliability. These Acme "pluses" and many more are the reason why Acme systems are the answer to air conditioning for multi-room buildings of *all* types . . . motels, hotels, apartments, hospitals, offices. Call your nearby Acme sales engineer.

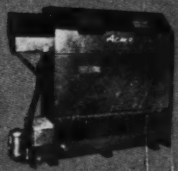
air conditioning



Packaged Chillers, 1½-220 tons

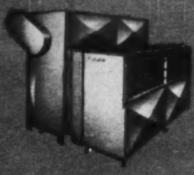


Cooling Towers, 3-120 tons

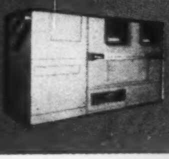


Evaporative Condensers, 10-110 tons

Remote Room Conditioners, 200-600 cfm



Air Handlers, 665-36,000 cfm



Packaged Air Conditioners, 3-60 tons

in Atlantic City motels

Acme

INDUSTRIES, INC.
JACKSON, MICHIGAN

MANUFACTURERS OF QUALITY AIR CONDITIONING
AND REFRIGERATION EQUIPMENT SINCE 1919

TO KEEP MAINTENANCE COSTS DOWN . . .

New $6,000,000 Hospital Selects LUNKENHEIMER VALVES

Thanks to sound planning, valve maintenance expenses in this new Hospital will be kept to a minimum. Lunkenheimer Solder End Valves were installed because, part-for-part, they provide longer maintenance-free performance than any other valves designed for similar service. They have established unmatched performance records on steam, hot and cold water lines, heating and air conditioning systems, as well as oil and gas lines, in commercial, industrial and institutional buildings all over the world. Why put less than the best in specifications, when the best costs no more? For specific recommendations on maintenance-saving Lunkenheimer Valves for new projects or for manufactured equipment . . . write The Lunkenheimer Company, Cincinnati 14, Ohio.

This impressive $6,000,000 structure will house the new Methodist Hospital, located just west of Minneapolis, in St. Louis Park. It will provide over 276 beds and 60 bassinets for the surrounding community, and a four-floor nurses' residence for over 135 student nurses and other personnel.

Hospital Administrator: Vernon T. Spry
Chairman of Building Committee:
Clifford G. Retherford
Architects and Engineers:
Ellerbe and Company
General Contractor: Kraus-Anderson, Inc.
Plumbing Superintendent:
Douglas Erickson
for Belden Porter Company

FREE Piping Practice Wall Chart on Valve Selection, Installation, Maintenance

LUNKENHEIMER
QUALITY

LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

VACUUM and PRESSURE GAUGES

TEST GAUGES—Equal or exceed A.S.A. Grade AA standards. Accuracy within ± ¼% of scale. Sizes from 4½ to 16 inches. **Catalog 400.**

PROCESS GAUGES—The premium SUPERGAUGE line. Accuracy: ± ½% of scale. Available with integral solid front wall for safety. **Catalog 1819.**

"A-LINE" GAUGES—Economical; mid-scale accuracy: ± 1% of scale. Meet all A.S.A. Grade A standards. Cast aluminum case, std. **Catalog 305.**

"O.E.M." GAUGES—Low-cost, drawn case line. Precision-built on volume basis. Midscale accuracy: ±2% of scale. Meet all A.S.A. Grade B standards. **Catalog 64A.**

AUTOMATIC CONTROLLERS
Indicating or Recording

"PILOT" CONTROLLERS—Low-cost pneumatic control. Thermometer or pressure elements. Can be valve mounted. **Catalog 510.**

BY-PASS PANEL mounts below "Pilot" for manual control. **(Bulletin F023).** Another option permits remote pneumatic set point adjustment. **Bulletin F024.**

PILOT-POSITIONER mounts on valve. Combines indicating pneumatic control with quick, accurate valve positioning. Compact and low-cost. **Bulletin F029.**

RECORDING CONTROLLERS with thermometer or pressure elements. Pneumatic or electric contact control. Charts: 6, 9, or 12-in. **Catalog 456A.**

USG INSTRUMENTS AND CONTROLS FOR

Temperatures from −350 to +1000 F • Pressures from 30 in. Hg vac. to 20,000 psi and above

THERMOMETERS
Mercury, Vapor, Gas or Organic Fills

"SUPERTHERM" DIAL TYPE in remote or direct reading (rigid stem or Multi-Angle) styles. Sizes: 3½, 4½, 6 and 8½ in. **Catalog 205.**

DRAWN CASE, DIAL TYPE for O.E.M. applications with lower accuracy requirements. Remote or direct reading styles. Sizes 2 to 8½ in. **Catalog 64A.**

USG RECORDERS—New 12-in. model features modern case with recessed bottom for easier connection. Available for pressure, too. **Bulletin 3025.**

INDUSTRIAL GLASS STEM TYPES with highly visible "Red-reading Mercury." Variety of mountings. Sizes: 5, 7, 9, and 12-in. **Catalog 101.**

PNEUMATIC TRANSMISSION

PNEUMATIC TRANSMITTERS. Indicate transmitted variable. Match "Pilot" case. Accurate, sensitive, dependable. **Catalog 510.**

PNEUMATIC RECEIVERS. Offered in broad line. Bourdon or diaphragm actuation; 4½ to 16-in.; accuracy: to ¼% of scale; single or duplex. **Catalog 510.**

GAUGE ACCESSORIES

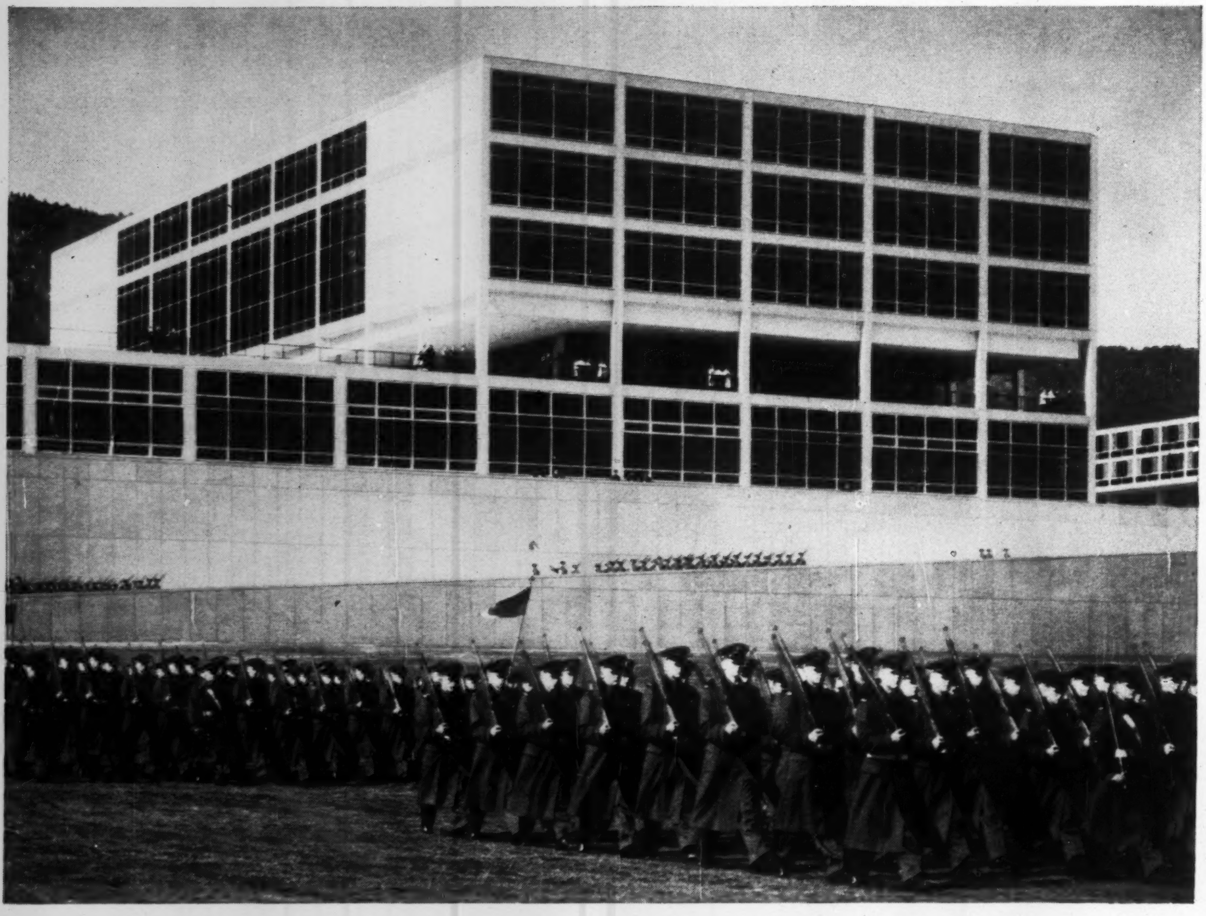
USG accessories include a complete line of chemical attachments and pulsation dampeners. Also, pressure snubbers, gauge fittings, and tools. **Catalog 605.**

Find Your Nearest Distributor In The 'Yellow Pages'

UNITED STATES GAUGE

Division of American Machine & Metals, Inc., 150 Clymer Ave., Sellersville, Pa.

USG®

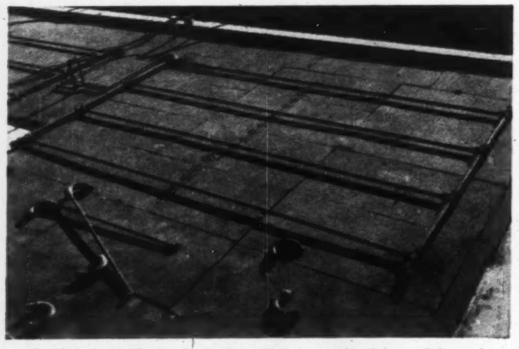


At the end of the day, **steel pipe** brings the comforts of home to the airmen of tomorrow

Saturday's parade ends a schedule-filled week for 1,500 cadets at the U. S. Air Force Academy near Colorado Springs. From the parade grounds the cadets return to their quarters . . . the world's most modern in comfort and convenience for housing the nation's air-leaders of tomorrow.

Steel pipe contributes much to making the Academy the world's finest. For radiant heating over five miles of *steel pipe* were used. In the 17,800 acre Academy Complex, the plumbing, vent and drainage lines were fabricated from *steel pipe*. And, it was used because—in an evaluation of service life, ease of fabrication, availability and cost—*steel pipe* proved superior to any other tubular product.

At the U. S. Air Force Academy, as in buildings throughout the nation, *steel pipe* is the perfect, low cost tubular conductor of water, gas and oil. The high thermal conductivity and structural strength of *steel pipe* make it ideal for many applications including radiant heating, cooling, refrigeration, ice making, snow melting, electrical conduit and myriads of residential, commercial and industrial applications.



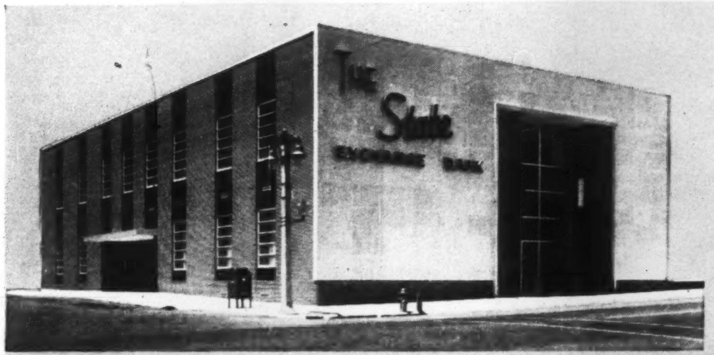
Prefabricated steel pipe sections resulted in quick and easy installation for the radiant heating system at the Academy. Because the coefficient of expansion of steel pipe and the concrete slab in which it's embedded are compatible—long service life is assured.

STEEL PIPE IS FIRST CHOICE

- Low cost with durability
- Strength unexcelled for safety
- Formable—bends readily
- Weldable—easily, strongly
- Threads smoothly, cleanly
- Sound joints, welded or coupled
- Grades, finishes for all purposes
- Available everywhere from stock

INSIST ON PIPE MADE IN U.S.A.

COMMITTEE ON
STEEL PIPE RESEARCH
150 East Forty-Second Street, New York 17, N.Y.



COMPLETE BANK MODERNIZATION JOB INCLUDES... B&G

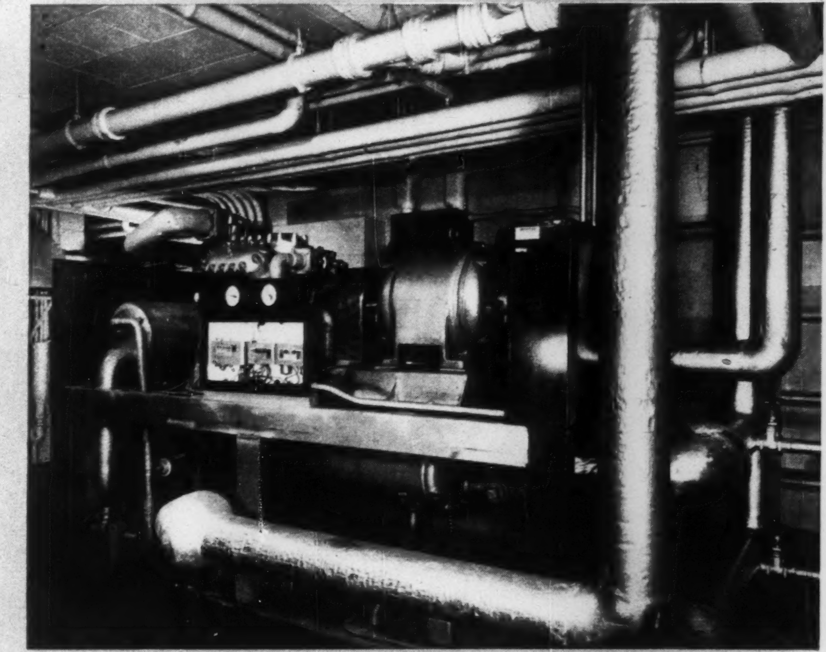
PACKAGE LIQUID COOLER

In this "100% remodeling" of The State Exchange Bank, Culver, Indiana, the old bank was stripped down to its framework and completely rebuilt inside and out.

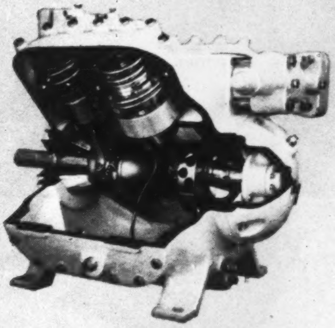
Remodeling included installation of a cooling system using a B&G Package Liquid Cooler, the advanced design unit that's completely new in conception.

Numerous features have been designed into this unit to make it more compact, more efficient and longer lived. It is equipped with B&G products throughout—the only unit of its kind with all major components designed, built and guaranteed by one manufacturer. Everything is included—there are no extras to buy. Thus costs which might otherwise be charged to the job are eliminated.

With all its advantages, the B&G Package Liquid Cooler is strictly competitive in price.



B&G Package Liquid Cooler installed in The State Exchange Bank, Culver, Indiana. This is a 40-ton capacity unit with a six-cylinder B&G Compressor. A B&G Series 1531 Centrifugal Pump circulates chilled water.

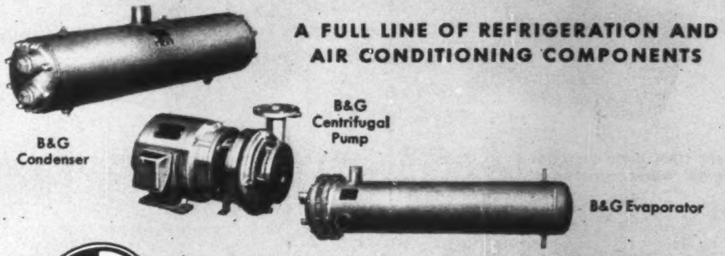


B&G COMPRESSOR

—a new unit to meet today's requirements

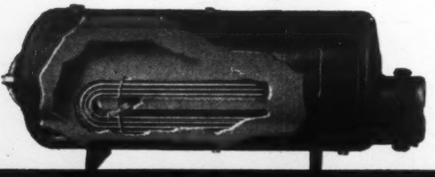
Like the Package Liquid Cooler this unit, too, is new in conception—not an adaptation of designs originated 20 years ago. Better design means fewer parts—and fewer maintenance problems. All units have *one* bore diameter—a few interchangeable parts will service them all. B&G Compressors can be equipped with multi-step capacity control systems.

A FULL LINE OF REFRIGERATION AND AIR CONDITIONING COMPONENTS

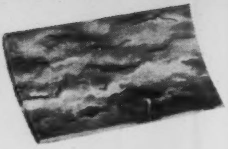


BELL & GOSSETT
COMPANY
Dept. RGA-5, Morton Grove, Ill.
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

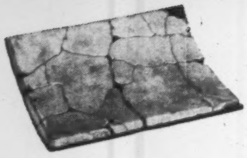
SPECIAL CEMENT LINING
for storage water heaters



PRE-KRETE ADDS YEARS OF RUST-FREE SERVICE



Plain steel plate corrodes even under normal water conditions.

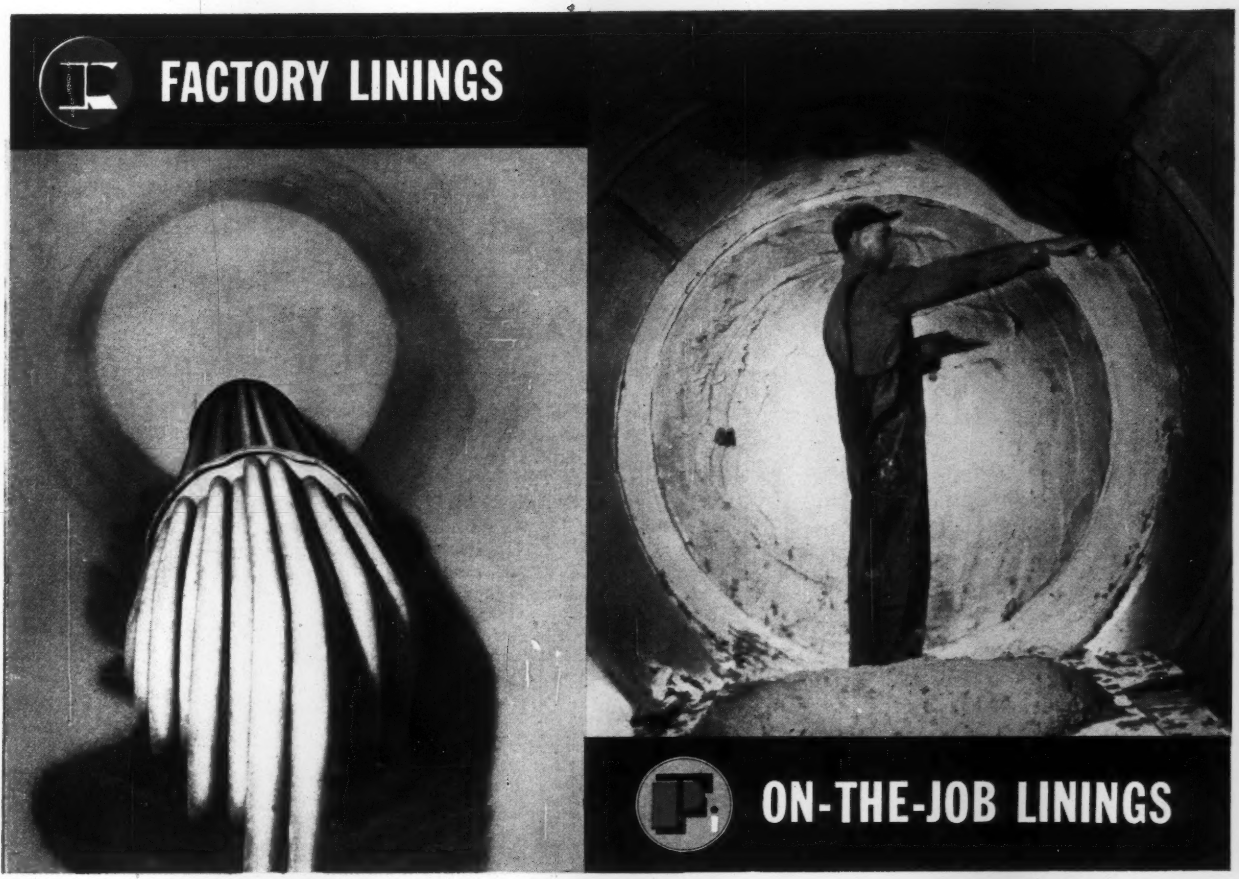


Ordinary cement linings tend to flake, crack and shrink, resulting in high maintenance costs.

Pre-Krete lining remains in perfect condition after exhaustive testing.

SPECIAL FORMULA C-17 PRE-KRETE is a rust and corrosion resistant hydraulic cement lining for steel storage water heaters. It is extraordinary in composition and uniformity. With the aid of special additives, it doesn't chip, crack or flake even at temperatures up to 900°F. Still more important, it is blended in Twin-Shell blenders designed, developed and patented by P-K. An intimate uniformity results that prevents weak spots or "holidays." Maintenance costs are lowered appreciably.

FACTORY LININGS. A P-K Pre-Krete lined water heater costs only slightly more than a plain steel heater, lasts twice as long! A strong, durable ¾" coating is applied, including manhole, coverplate and heating element nozzle. All materials and workmanship are fully guaranteed. And you get



thermal designing that has maintained an unexcelled reputation for over 75 years, plus advanced fabrication techniques that meet all ASME specifications.

ON-THE-JOB LININGS of Pre-Krete give corroded steel vessels – open as well as closed – a long, new life. Unconditionally guaranteed applications are made by franchised applicators of Pocono Fabricators Inc., a division of Patterson-Kelley. Downtime for lining an average vessel: about 48 hours. Also available for "Do-it-yourself" application.

We'd be glad to send descriptive catalogs and more information. Just write, telling us whether you would like to know about new factory lined storage water heaters or on-the-job linings. Address Patterson-Kelley Co. Inc., East Stroudsburg, Pa.

FRANCHISES AVAILABLE. A few Pre-Krete franchise territories remain open in our nationwide network. Franchised applicators are carefully chosen. We'd appreciate your recommendations.

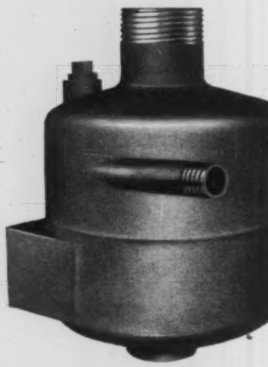
Patterson Kelley

Water Heater Division

storage water heaters • instantaneous heaters • convertors • freon waterchillers • water to water exchangers • gas fired storage water heaters

2 SURE WAYS TO BEAT HIGH MAINTENANCE COSTS!

1



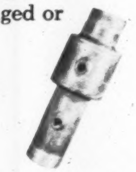
ASK FOR BULLETIN

WILSON CENTRIFUGAL BLOWDOWN SEPARATOR

SOLVES BOILER BLOWDOWN DISPOSAL PROBLEMS

Here is a safe, economical way to handle boiler blowdown . . . at atmospheric pressure. Steam flash is instantaneously cleared through the large top vent pipe. Water and sludge fall by gravity through bottom drain. No objectionable noise. Install where convenient, inside or out—even on boiler room roof. One Wilson Separator can handle two or more boilers in battery, if desired. Models with threaded, flanged or butt welding connections available.

NEW! WILSON AFTERCOOLER
Effectively reduces temperature of blowdown before entering sewer. Easy to install—requires no maintenance. ▶



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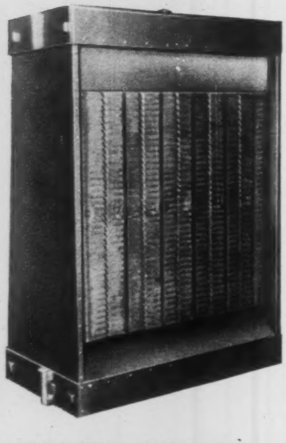


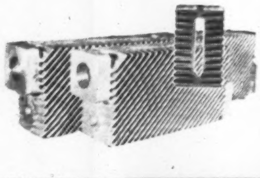
ASK FOR BULLETIN

WILSON UNIT HEATERS

with "LIFETIME" ALL-CAST ALUMINUM ELEMENT

Provides large volume of air over wide floor area, continuously, economically. Sturdy enclosure houses the patented Wilson all-cast aluminum radiation element with integrally cast directional fins. Completely eliminates the need for costly, troublesome louvers. Recognized as a unit heater that is completely dependable in service where corrosive atmospheres are encountered. *Capacities 64,000 to 430,000 BTU.*

WILSON ALL-CAST ALUMINUM RADIATION ELEMENT
This is the same proved radiation element used so successfully in severe diesel locomotive service. Chamber shape plus the patented 45° direction fin feature provides high thermal efficiency, in a compact design. Extremely rugged in construction. High pressure hydrostatic tested.



WILSON ENGINEERING CORPORATION
6 NORTH MICHIGAN AVENUE CHICAGO 2, ILLINOIS
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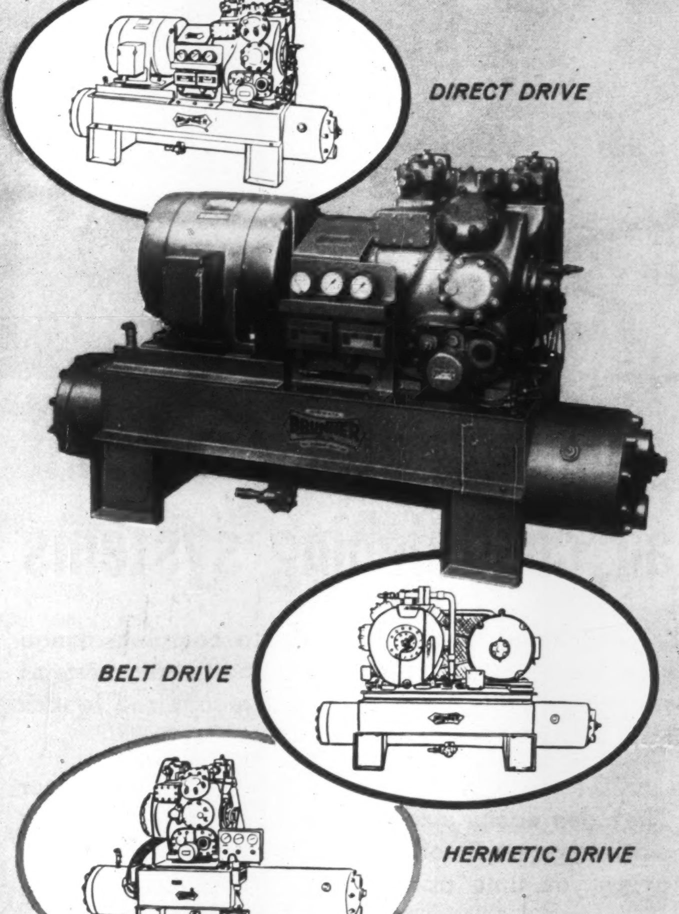
from **BRUNNER**

SINCE 1906

. . . Multi-Drive Compressors

with SPECIFICATION FLEXIBILITY



Again—from the leader—
a beneficial advance in compressor adaptability.

Brunner's new line of multi-drive units can fully satisfy *any* compressor requirement . . . providing a specification flexibility that substantially widens application latitude.

As illustrated, the line includes the direct drive model, the hermetically sealed model, and the belt-driven model. And to ensure the integrity of performance for which Brunner has been famous for fifty-three years, these units are constructed of only the highest grade materials; and are equipped with built-in capacity control, oil control valves, replaceable cylinders, and other important features.

The line's horsepower range is 7½-100. Each model is obtainable in either the water-cooled or the evaporative type.

For more information, contact the Dunham-Bush sales engineer near you, or write for Form No. 775.

Dunham-Bush, Inc.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

DUNHAM-BUSH

AIR CONDITIONING • REFRIGERATION • HEATING • HEAT TRANSFER

WEST HARTFORD, CONNECTICUT • MICHIGAN CITY, INDIANA
MARSHALLTOWN, IOWA • RIVERSIDE, CALIFORNIA

SUBSIDIARIES

heat-x HEAT-X, INC. BREWSTER, N.Y.
DUNHAM-BUSH DUNHAM-BUSH (CANADA), LTD. TORONTO, CANADA
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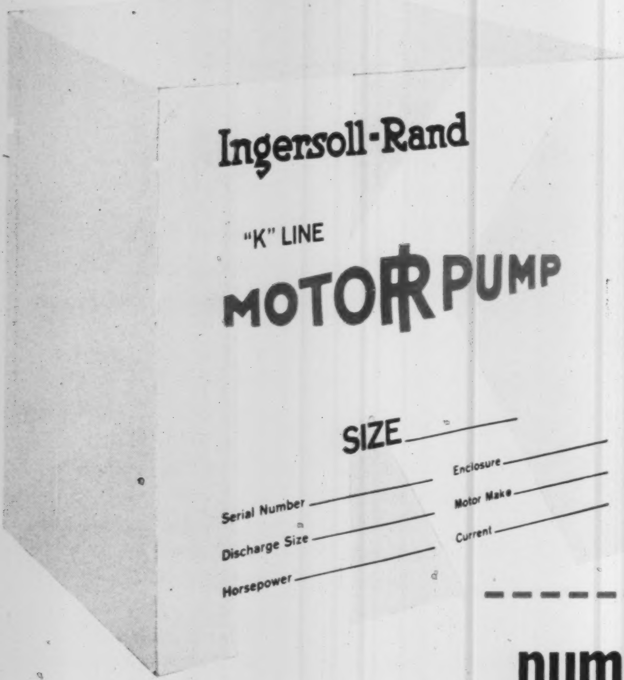
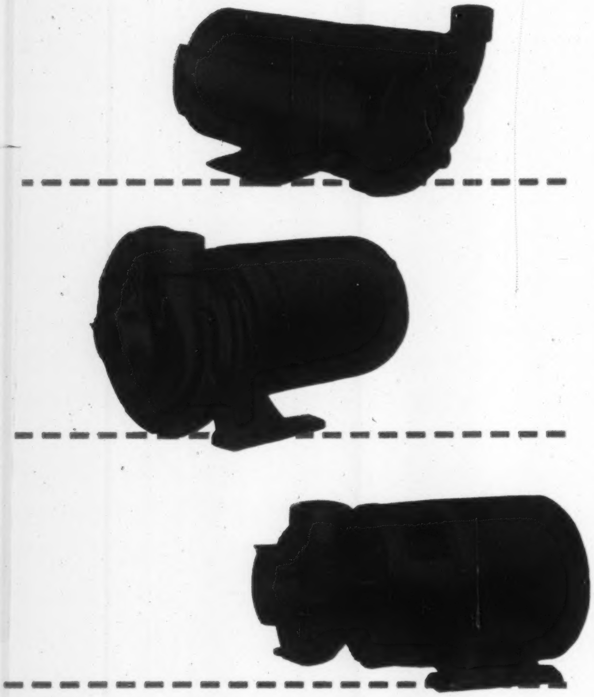
BRUNNER BRUNNER CORPORATION (CANADA) LTD. PORT HOPE, ONTARIO

New I-R "K" Line Motorpump...





pumping efficiency that matches all air conditioning systems

Now—with Ingersoll-Rand's new "K" Line Motorpumps—you have a complete range of efficient pumping power to meet the requirements of any air conditioning system! "K" Line Motorpumps add low cost dependability backed by the recognized leader in centrifugal pumps—Ingersoll-Rand.

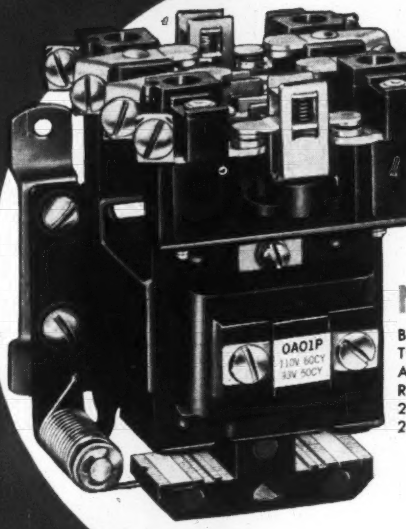
These packaged Motorpumps come in 20 sizes to cover a range up to 775 gallons per minute and heads up to 190 feet. They are easily stocked and easily selected for a given job. Moreover, their rugged construction and modern features combine to deliver continuous, trouble-free service—saving you time and trouble in costly call backs.

See for yourself how the new I-R "K" Line Motorpumps can increase your sales and profits. Write today for complete information to: Sales Manager, Merchandising Division, Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand
Merchandising Division
11 Broadway, New York 4, N. Y.

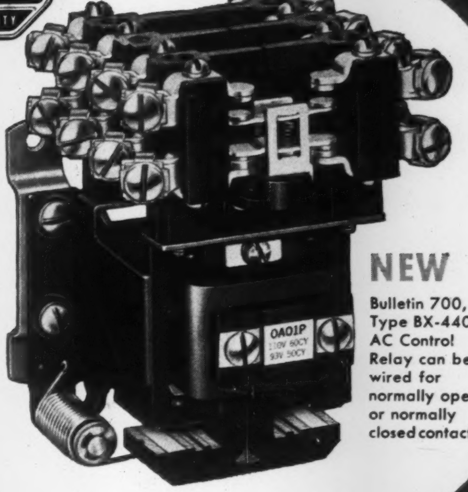
9-871A

A New Era
in
Relay Life and Reliability



NEW

Bulletin 700, Type B-220A, AC Control Relay with 2 N.O. and 2 N.C. contacts.



NEW

Bulletin 700, Type BX-440A, AC Control Relay can be wired for normally open or normally closed contacts.

NEW ALLEN-BRADLEY BULLETIN 700 RELAYS

Improved features set new performance standards

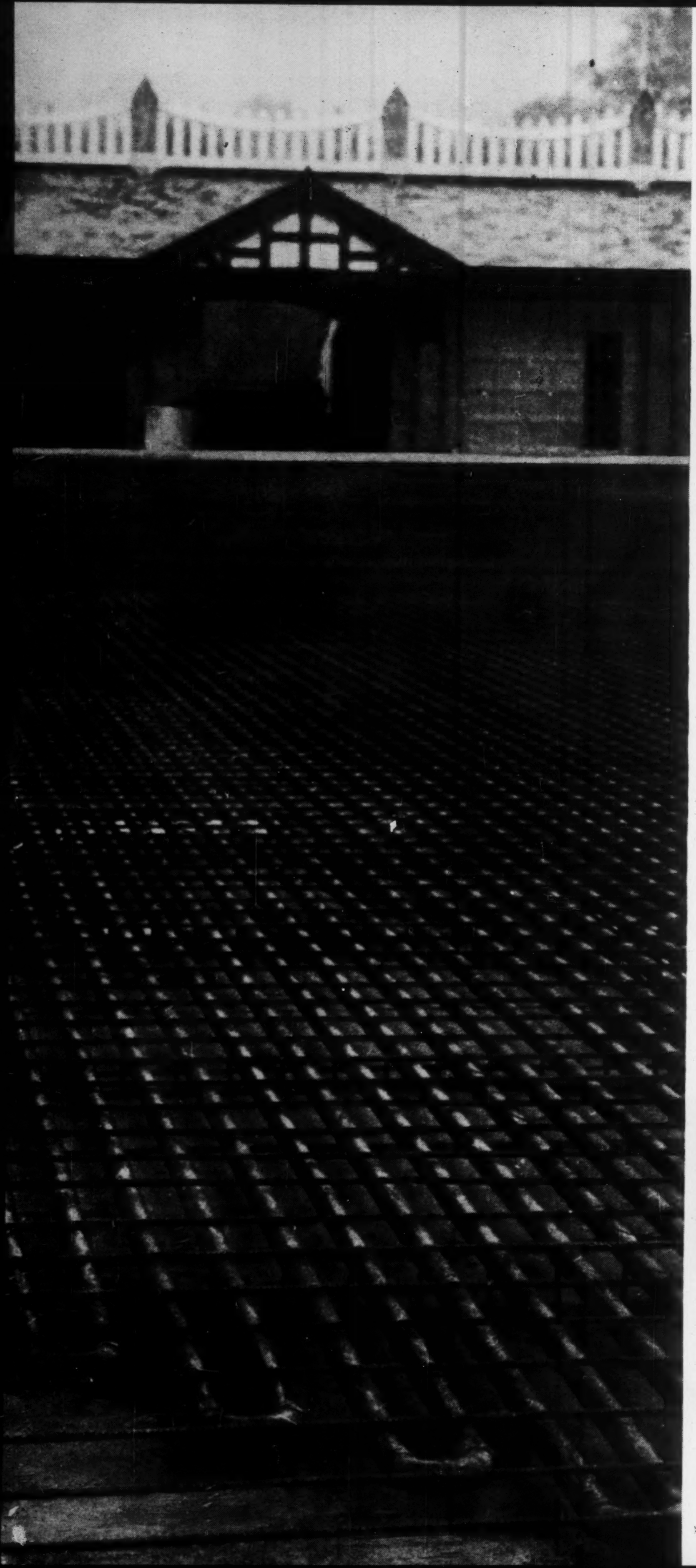
For years, Allen-Bradley Bulletin 700 Type B and Type BX relays have been preferred for their long life and trouble free operation. The improvements in the new Bulletin 700 Type B and Type BX relays will set new performance standards wherever they are used. Naturally they use the famous A-B double break, silver alloy contacts which always remain in perfect operating condition without cleaning or filing. The cast coil cannot be damaged by the severest atmospheric conditions.

These new Allen-Bradley Bulletin 700 Type B and Type BX relays offer even greater value and greater reliability than ever before—but the price has not been changed.

- **New mechanical design gives at least 5 times greater operating life.**
- **New contact motion provides 10 times greater electrical reliability.**
- **Complete interchangeability—mounting dimensions are unchanged.**
- **New hermetically sealed plastic coil fits Bulletin 700 relays presently in use.**
- **New, stronger, movable contact crossbar—also fits old relays.**
- **New reinforced stationary contact blocks—interchangeable with previous design.**

Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY Quality Motor Control



4-D

48,000 FEET OF WROUGHT IRON PIPE PROTECT THIS $200,000 ICE RINK AGAINST CORROSION

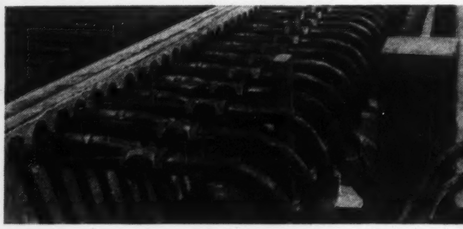
◀ The White Plains, N.Y., Municipal Rink in Recreation Park is a year-round fun-spot. In the winter: uninterrupted ice skating. In summer: roller skating, square dancing, basketball, volleyball, tennis and free concerts.

Miles of 4-D Wrought Iron Pipe help this municipality clear its biggest maintenance hurdle: rink piping corrosion.

Brines will attack just about any piping material. That's why designers of this rink had to be extra-sure. So they specified 1¼-inch diameter 4-D Wrought Iron Pipe to carry the brine needed to help form a smooth hard surface of ice. Every time. Without any leaky interruptions.

4-D Wrought Iron's composition and structure—high purity base metal laced with thousands of glasslike iron silicate fibers—is unique indeed alongside ordinary piping materials. Its steadfast resistance to corrosion is a proven cost-cutter in skating and curling rinks everywhere.

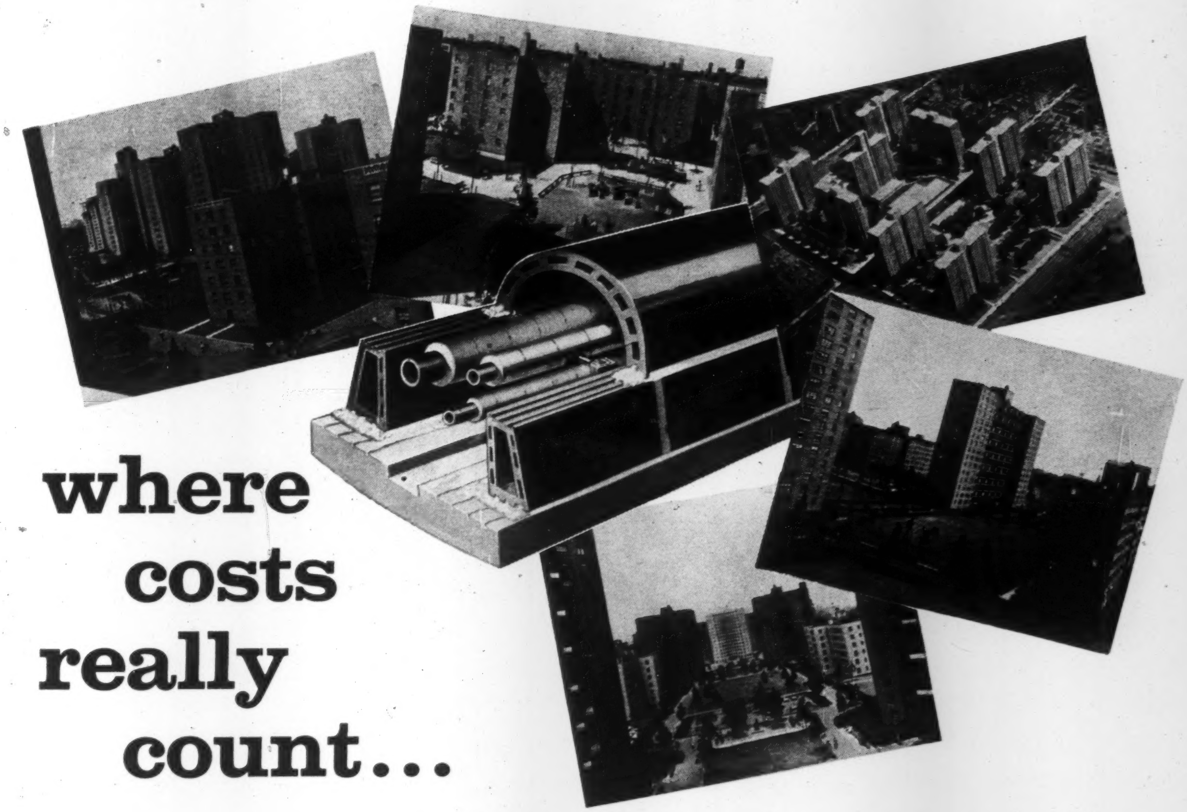
Are you piping for permanence? Here's an important first step: write for our special report "Ice Skating Rinks—Their Construction and Maintenance." A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.



Perfect bends in pipe at header area of circulating system reflect 4-D Wrought Iron's easy working properties. Peter Carver Associates of New York City was the design engineer. Armeco Ventures fabricated and installed the coils at the site.

BYERS 4-D WROUGHT IRON

TUBULAR & FLAT ROLLED PRODUCTS
Also Electric Furnace Amballoy Steels
and PVC Pipe, Sheet & Rod Stock
Corrosion costs you more than Wrought Iron



where costs really count...

Therm-O-Tile SAVES 3 WAYS!

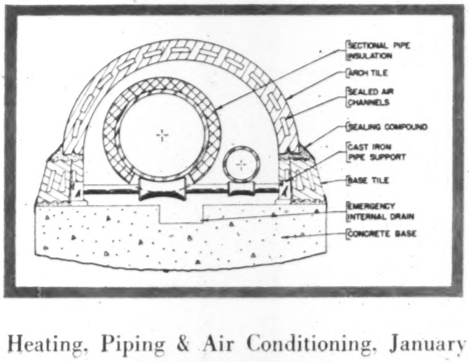
Consulting Engineers throughout the nation specify tile conduit for their public housing projects. Used in project after project for the nation's largest cities, Therm-O-Tile has proved itself efficient and economical in these 3 important areas:

1. **LOW INITIAL COST** . . . Simple installation of low cost materials makes for construction economy.
2. **LOW MAINTENANCE COST** . . . Piping failures within the Therm-O-Tile conduit can be easily and quickly located . . . easily and quickly repaired.
3. **LONGER LIFE** . . . Proved stronger in controlled laboratory testing than standard or extra-strength tile . . . non-deteriorating Therm-O-Tile installations last longer

In New York City alone, many miles of Therm-O-Tile have been installed in Housing Authority projects. Among them:

- Albany Houses
- Astoria Houses
- Bay View Houses
- Brownsville Houses
- Bushwick Houses
- Carver Houses
- Castle Hill Houses
- Jefferson Houses (Section III)
- Marcy Houses
- Marlboro Houses
- Millbrook Houses (Section II)
- Parkside Houses
- Red Hook Houses

For complete details and test results, write today to H. W. Porter & Co., Inc., 825 Frelinghuysen Ave., Newark 12, N. J. or to the office nearest you.



Therm-O-Tile®

CONDUIT

FOR UNDERGROUND PIPING

H. W. PORTER CO., INC.—NEWARK 12, N. J.
or Subsidiary
REID HAYDEN, INC.—BALTIMORE • CHARLOTTE • RICHMOND

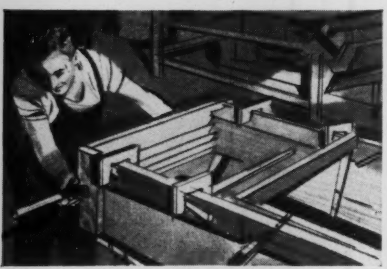
ANOTHER DIAMOND JUBILEE EVENT

Honeywell's Big Win

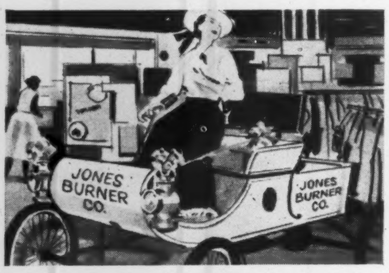
The Car
with
THE BACKWARD LOOK!

You may win this authentic reproduction of a 1901 Oldsmobile or one of ten $179.50 deluxe Heiland Pentax 35mm Cameras!

The "Merry Olds" is America's most unique innovation in motor car travel in half a century! Its top speed is 35 m.p.h. and it gets 65 miles to the gallon! This promotion-minded car is an old-fashioned seven feet, nine inches long and comes in black, bright red and wheat-yellow colors. Except for a few concessions to modern engineering advances, the "Merry Olds," in appearance, is an almost exact replica of the 1901 Oldsmobile!



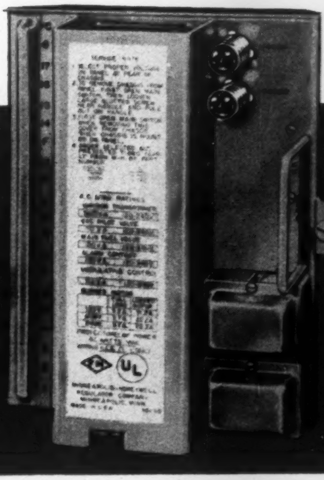
Hand-Crafted . . . The "Merry Olds" has the individual attention of skilled craftsmen. This incomparable touch of workmanship is your guarantee of fine quality built into every car.


JONES BURNER CO.
JONES BURNER CO.

Promotions . . . The attention-getting "stopper" value of the "Merry Olds" is a powerful sales promotion factor guaranteed to stimulate customer interest in your business.

Car of Many Uses . . . Whether it's marketing for mother or motoring the children, the "Merry Olds" is excellent for fun as well as business. So, send in your entry today!

-A-Wagon Contest!



- **Four rugged silicone diodes** replace rectifiers formerly used, to provide more rugged construction, reduce heat dissipation and assure long life.
- **50% fewer tubes** used than in former models—now encased in protective tube shields.
- **Simplified electronic timing**—one tube provides pre-purge, post-purge and trial for main flame ignition timings.
- **New armored back**—plus zinc-plated dichromate finish for increased resistance to corrosive industrial atmospheres.
- **Fits same mounting cabinet as former model of the R478 for fast, easy replacement.**

Now! Unmatched flexibility in a flame safeguard! Never before has one flame safeguard offered you so many applications and performance advantages: electronic flame detection, unparalleled sequencing flexibility, convenient voltage selectability, simplified electronic timing and many other features.

This new gold-colored R478 Protectorelay* is *transistor*-powered for long, trouble-free life. New armored back and zinc-plated dichromate finish wards off the effects of industrial atmospheres. And, you have your choice of flame detection: the R478A Protectorelay can be used with the foolproof new C7012 ultraviolet flame detector to sense both gas and oil flames, and can also be used with either flame rods or standard photocells. The R478B Protectorelay is used with a lead sulfide cell which can detect both gas and oil flames.

USE YOUR PROFESSIONAL SKILL! Estimate how many cycles this new Honeywell Flame Safeguard will make under rugged torture-testing!

Here's a chance for you to win an exciting new automobile or one of ten Heiland Pentax 35mm cameras —just for using your professional skill! Simply estimate how many cycles Honeywell's new Flame Safeguard will make under rugged torture-testing. To date, the Safeguard has completed 50,000 cycles —equivalent to over three years of normal use— and is still going strong.

Then, fill out and return the attached coupon, telling us your name, occupation, and your estimate as to the number of cycles the Flame Safeguard will make. The individual whose estimate comes closest to the correct number of completed cycles will win the sporty "Olds." The ten next closest estimates will win Heiland Pentax cameras. You may *revise* your estimate as often as you like providing that you use an entry blank (or reasonable facsimile) and that your entry is postmarked before the official end of the contest (the day the R478 stops cycling or May 15th—whichever occurs first). Earliest postmarks will determine winners in the event of ties.

Contest is open to dealers, installers, servicemen, consulting engineers and manufacturing personnel in the commercial-industrial boiler or burner business.

How the "torture test" will be conducted: Under simulated working conditions, the R478 will be heated to its maximum ambient temperature, with representative burner controls attached. Varying cycling rates will simulate potential power failures.

*Trademark

Honeywell

H HONEYWELL First in Control

SINCE 1885

75th YEAR PIONEERING THE FUTURE

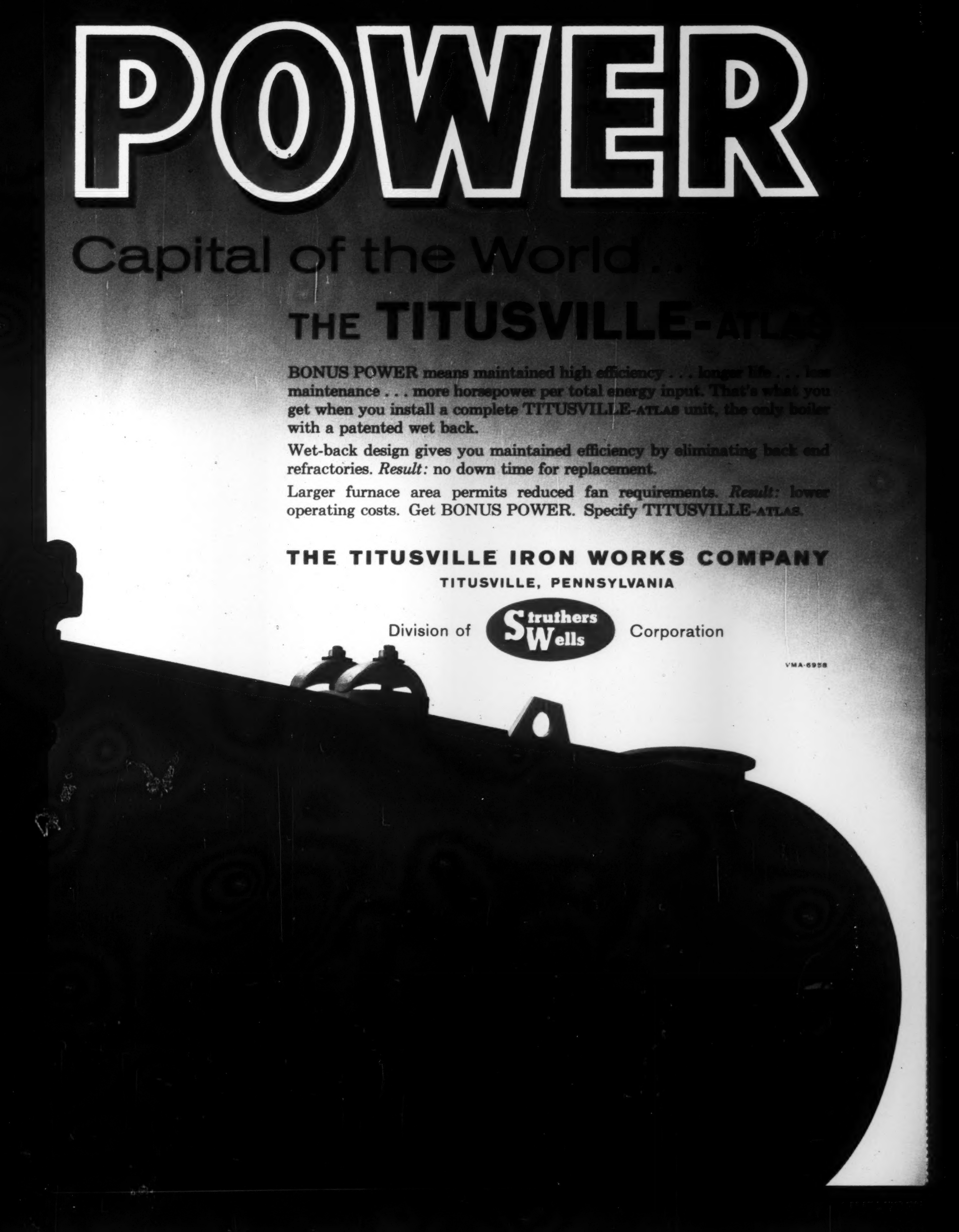
Minneapolis-Honeywell
Dept. AC-1-15
Minneapolis 8, Minnesota

Name .... *Title* ....
Company .... *Address* ....
City .... *State* ....
My occupation is: (Check one) ☐ O.E.M. ☐ Distributor
☐ Dealer, installer or serviceman ☐ Consulting Engineer
My prime interest is (Check one): ☐ Burners ☐ Boilers
I think the new Flame Safeguard will make..................cycles.

BONUS

from the Boiler

THE
TITUSVILLE
ATLAS
FROM THE BOILER CAPITAL OF THE WORLD
TITUSVILLE PENNSYLVANIA



POWER

Capital of the World . . .

THE TITUSVILLE-ATLAS

BONUS POWER means maintained high efficiency . . . longer life . . . less maintenance . . . more horsepower per total energy input. That's what you get when you install a complete TITUSVILLE-ATLAS unit, the only boiler with a patented wet back.

Wet-back design gives you maintained efficiency by eliminating back end refractories. *Result:* no down time for replacement.

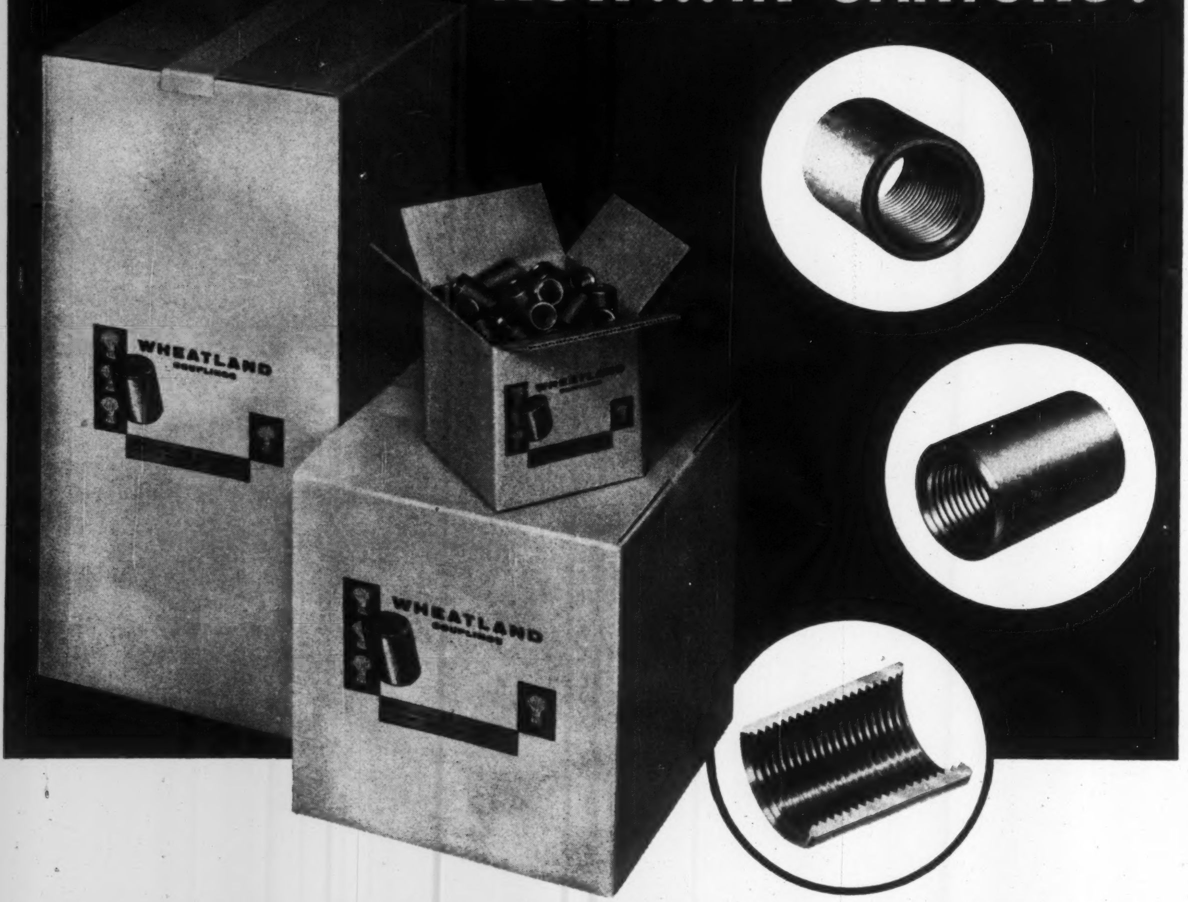
Larger furnace area permits reduced fan requirements. *Result:* lower operating costs. Get BONUS POWER. Specify TITUSVILLE-ATLAS.

THE TITUSVILLE IRON WORKS COMPANY
TITUSVILLE, PENNSYLVANIA

Division of Struthers Wells Corporation

VMA-6958

NOW... IN CARTONS!



WHEATLAND STEEL COUPLINGS

Your new profit packages—plainly-marked cartons of Wheatland Steel Couplings! Easy to stock, inventory and use. Wheatland Couplings are made with precision to assure you, always, of the qualities that mean extra profits for you:

- **Clean outside finish**
- **Continuous even-depth thread**
- **Deep round chamfer**
- **Black... or with heavy, galvanized coating**

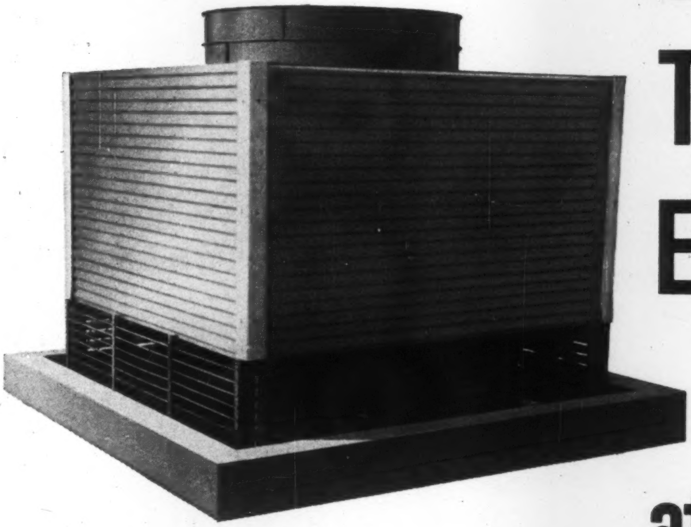
Sell or use Wheatland Steel Couplings!

WHEATLAND STEEL PRODUCTS COMPANY

Affiliated with Wheatland Tube Company
BANKERS SECURITIES BLDG., PHILADELPHIA 7, PA.
MILL: WHEATLAND, PA.

FLUOR OVER 40 YEARS OF COOLING TOWER EXPERIENCE

* Since 1919 Fluor has been building cooling towers throughout the world. (An average of one new industrial or commercial cooling tower is erected by Fluor every three days.)



at your service *

Ask for our brochure FP-131 that shows why Fluor Towers mean more efficient operation.

See our exhibit in Dallas at the 2nd Southwest Heating and Air Conditioning Exposition February First to February Fourth.

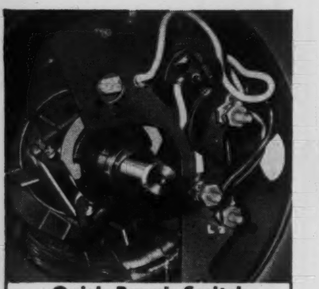
Fluor
PRODUCTS COMPANY

AIR CONDITIONING
AND REFRIGERATION
COOLING TOWERS

A division of The FLUOR CORPORATION, Ltd.

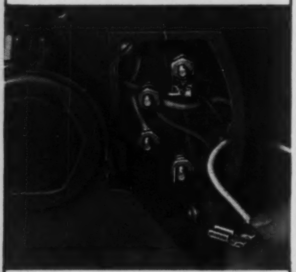
GENERAL OFFICES:
SANTA ROSA, CALIFORNIA

NO STARTING PROBLEMS
with
WAGNER CAPACITOR-START MOTORS



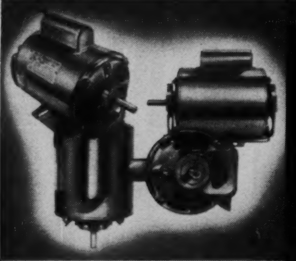
Quick Break Switch

The starting winding is disconnected from the line by this Wagner designed switch . . . test proved to make more than a million breaks. (That adds up to two starts per hour for 50 years!)



Quick Connect Terminals

Brass tabs on terminal studs permit quick, easy connection of leads . . . cut wiring time to speed assembly line production. Simply press the lead receptacle on to the stud—a positive connection is assured.



All-Angle Operation

The sleeve bearing design, in fractional hp ratings, has a positive lubrication system that permits operation in any position . . . can mean important savings in motor costs to manufacturers.

Pack more power into less space...give long troublefree service...are easy to hook up

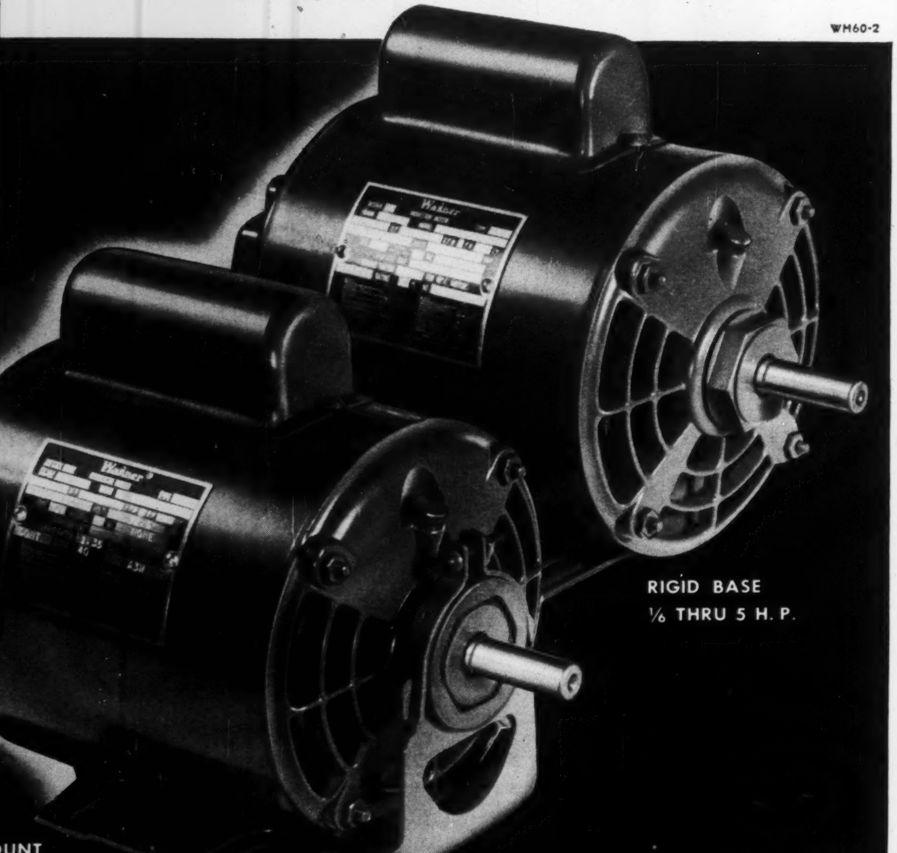
Here are general purpose single-phase motors that have high starting torque and high pull-in torque. When used in the proper application and supplied with voltage close to their rating, they'll give positive starts every time. Troublefree operation is assured . . . thanks to the positive action of the Wagner governor mechanism and long life quick-break switch.

Wagner Type RK Motors pack more power into less space. Small enough to fit in tight spots, their ruggedness is built-in . . . permits direct mounting. They are available in a range from ⅙ through 5 horsepower, with sleeve or ball bearings, and with rigid bases or resilient mountings. And, sleeve bearing fhp models can be operated in any position.

Get these motors from leading distributors in your city, or from Wagner Sales Offices in 32 cities across the country. Your Wagner Sales Engineer will be glad to help you select the right motor for your application. Wagner Bulletin MU-217 gives full details on Capacitor-Start Motors.

Wagner Electric Corporation
6370 Plymouth Avenue, St. Louis 33, Missouri

WM60-2



RIGID BASE
⅙ THRU 5 H. P.

RESILIENT-MOUNT
⅙ THRU 5 H. P.

AcoustaFan

featuring the
Flow-Nozzle Air Foil Wheel
for **QUIET** operation . . .

SEND FOR BULLETIN 592.

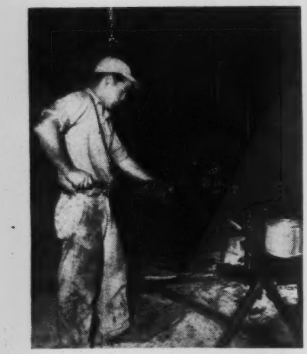
nyb

THE NEW YORK BLOWER COMPANY
Sales offices: 3149 South Shields Avenue • Chicago 16

Tough installation! To provide ample clearance of 20 ft. Spang Pipe was installed at ceiling level, had to be "woven" through girders. Sizes ranged from ½" to 10".

"SPANG steel pipe is as near to perfect pipe as you can get"

says Mr. Ray Hilton, President and General Manager, Higham-Hilton Plumbing Co., Salt Lake City, Utah



Easy threading! Characteristic uniformity of Spang Pipe provided fast, accurate threading on the Wagner Bag job. All connections were either welded or coupled.

Wagner Bag Company Building heating, cooling and plumbing systems serviced by 2 miles of Spang Steel Pipe

"Spang Steel Pipe is a good, uniform pipe, easy to thread and bend, and has a smooth interior finish free of any obstructions," says Mr. Hilton. "About 90% of the pipe installed on the Wagner Bag Company job is exposed; it makes a good, clean appearance.

"We used Spang Pipe on this job because of our past experience with it, and because we could get good delivery when we needed it. It gave us a smooth, trouble-free installation. We expect it to provide good service for the life of the building. I think it's one of the best products on the market."

For new construction, renovation or routine maintenance, you can't beat Spang Steel Pipe!

It's quality-controlled in manufacturing to provide uniformity throughout . . . tested and inspected to assure top-quality performance at the job site and in service . . . proven by thousands of installations. Your Spang Distributor can provide fast service on your order. Give him a call. Make it Steel Pipe . . . Make it Spang!

Architect: Carpenter & Stringham, Salt Lake City
General Contractor: Tolboe & Harlin, Salt Lake City
Plumbing Contractor: Higham-Hilton Plumbing & Heating Co., Salt Lake City
Spang Distributor: Wasatch Plumbing Supply Co., Salt Lake City

SPANG CW STEEL PIPE

THE NATIONAL SUPPLY COMPANY

Two Gateway Center, Pittsburgh 22, Pennsylvania

Subsidiary of Armco Steel Corporation ARMCO

NOW OCTAGON'S

VENT-X-IT

[illegible] under one or more of the following patents: [illegible]

The Volume Roof Ventilator Of Handsome Craftsmanship

● Looks good—acts good—is good at exhausting masses of obnoxious air Designed for low silhouette buildings that require more dependable ventilation, VENT-X-IT is manufactured in a variety of sizes and capacities with either direct or belt driven axial or centrifugal backward curved non-overloading fans. Heavy gauge spun aluminum housing throughout will last the life of the building, maintenance is practically nil, and installation as simple as putting on your hat. Can be supplied without fans and motors for air intake or as relief ventilators.

The VENT-X-IT is an important member of the complete line of Octagon roof ventilators. From the smallest shop to the largest industrial plant there is a powered or gravity Octagon for all conditions and volume of air.

Capacities rated in accordance with standard test codes by the Texas Engineering Experiment Station.

OCTAGON VENTILATOR CO.

CUSTOM CONSTRUCTION AT PRODUCTION LINE COST

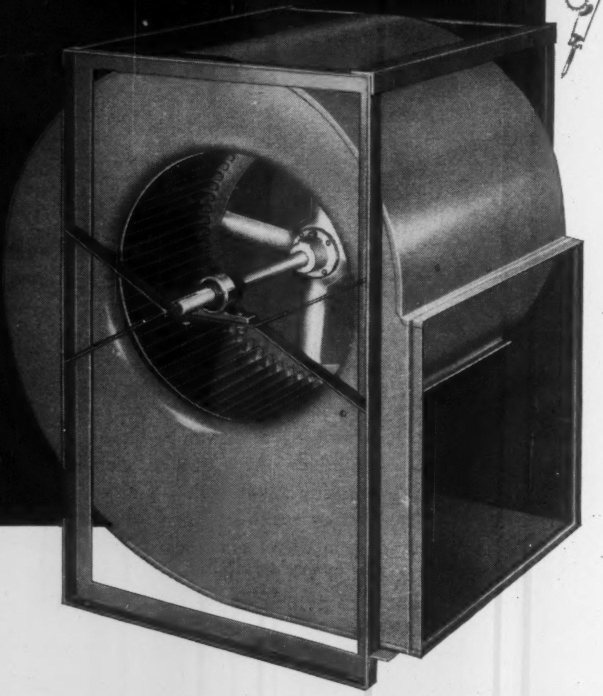
5828-30 SOUTH OAKLEY AVENUE • CHICAGO 36, ILLINOIS

AU

SERIES A

22", 25" and 30"

CIAL INSTALLATIONS



Built-in flexibility makes the Lau "Series A" the number one choice for commercial and industrial installations. With a C.F.M. range of from 8,000 to 36,000, this efficient unit may be used in many different sizes and types of air conditioning systems. For even greater C.F.M. capacity and flexibility the "Series A" may be operated in banks of two or three.

The "Series A" features such quality Lau parts as heavy gauge riveted wheels, large reservoir oil type bearings and sturdy angle framing for housing supports and structural strength. "Series A" blowers provide for either top or rear mounting motor.

Call or write Lau today for more complete and detailed information.

MEMBER
NATIONAL WARM AIR HEATING
INDOOR COMFORT
AND AIR CONDITIONING ASSOCIATION

The Lau Blower Company, 2027 Home Avenue, Dayton 7, Ohio.

Other plants in Kitchener, Ont., Can., and Irwindale, Calif.

LAU

World's Largest manufacturers of Air-Conditioning Blowers for

Warm Air Furnaces

Central Air Conditioning Systems

Evaporative Coolers

Cooling Towers

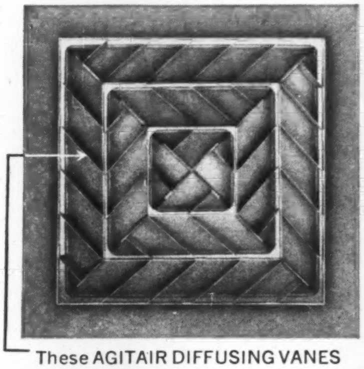
Remote Condensers

it's what's inside that counts!

AGITAIR® air diffusers

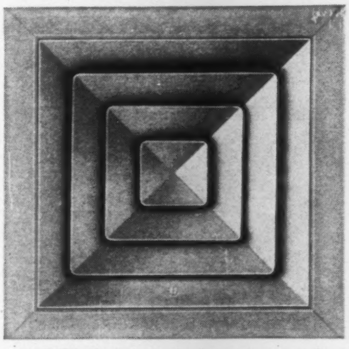
WITH BUILT-IN DIFFUSING VANES CONTROL EVERY CUBIC FOOT OF AIR IN ANY ENCLOSURE

AGITAIR Diffuser



These AGITAIR DIFFUSING VANES provide 64 active air jets to every square foot of the diffuser.

Most Copied Design



AGITAIR originated square and rectangular designed diffusers.

AGITAIR unequaled performance efficiency ...job-proven more than 1,000,000 times

Air Devices Inc., engineers designed, developed and pioneered the application of AGITAIR square, rectangular air outlets with built-in diffusing vanes to replace the use of unpredictable air distribution from vaneless plaques.

Today, more than 1,000,000 AGITAIR custom-made square and rectangular diffusers are installed on thousands of applications in all kinds of business.

AGITAIR diffusers provide 100% draftless air distribution from any location in the ceiling or sidewall with blows in 1, 2, 3 or 4 directions and with no stagnant areas in the conditioned spaces. No blank offs.

The vane and louvre construction of AGITAIR square and rectangular air diffusers produces counter-flowing air streams or jets (64 to a square foot). This action induces movement of all room air toward the diffuser while rapidly mixing the conditioned air with room air to assure instantaneous temperature equalization and draftless distribution. Plaques are incapable of performing these basic functions.

Every feature of these AGITAIR diffusers has been designed to assure complete users satisfaction. Appearance . . . performance . . . noiseless . . . draftless air distribution. For complete engineering data on these AGITAIR custom-made diffusers ask your local AGITAIR representative or write direct to Air Devices Inc.

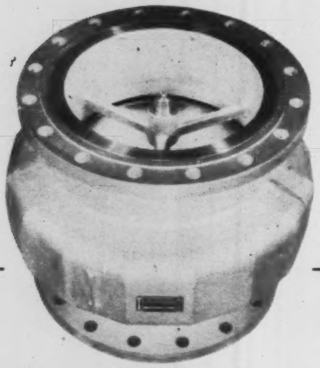
AGITAIR®
SQUARE AND RECTANGULAR AIR DIFFUSERS

air diffusers • filters • exhausters
registers and grilles

AIR DEVICES INC.
185 MADISON AVENUE, New York 16, N. Y.

MILLER *STREAMFLOW*

CHECK VALVES . . .



a size and style
for every job

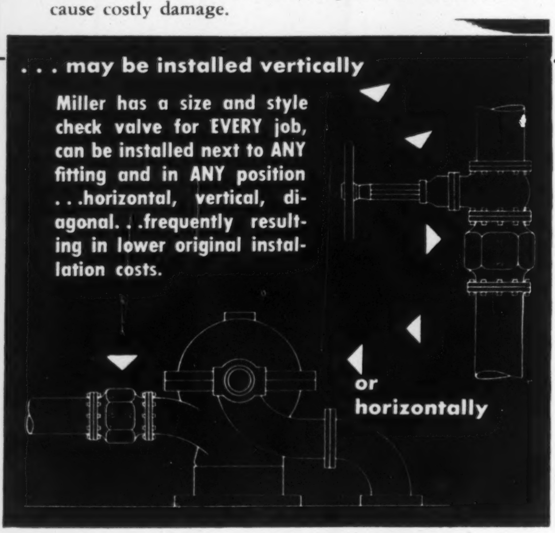
simplicity in design • trouble-free

- **MINIMUM PRESSURE LOSS**
  Miller Check Valves afford minimum pressure loss due to the very specially designed disc and VENTURI design at outlet.
- **SHOCK-PROOF**
  Miller valves are Shock-Proof and entirely silent in operation. Completely eliminates "water hammer", water back-flashing or turbulence, giving longer, trouble-free life to the entire piping installation.
- **FULL FLOW**
  Exclusive with Miller is WIDE opening . . . allowing the very maximum in full flow through the valve. A specially designed conical shaped spring allows the opening of the disc to the fullest point found in any check valve.
- **GREATER AREA**
  Our product research engineers have found the octagonal shaped valve offers the greatest internal area and actually decreases weight. Greater internal area in the valve, results in better efficiency and longer life.
- **OPERATION**
  Miller valves are designed that the disc travels ¼ inch per inch of nominal pipe size when fully opened, thereby allowing full flow. Valve bodies are hydrostatically tested to pressure exceeding 4 to 1 safety factor. Miller Center Guided Check Valves have only FOUR parts: the body, the seat ring, the specially designed conical spring and the streamlined center guided disc. Thus, no internal screws or bolts to corrode in place, or work loose to cause costly damage.

. . . and proved in operation on these exacting installations

Armco, Middletown, Ohio, Butler, Pa. • Austin Company, Cleveland, Ohio • Bakelite Company, Boundbrook, N. J. • Bethlehem Steel Corporation • Buensod-Stacey Company, Charlotte, N. Carolina • Dravo Corporation, Pittsburgh, Pa. • Ford Motor Company—Engine Plant, Cleveland, Ohio • Pittsburgh Plate Glass Co. • H. K. Porter Building, Pittsburgh, Pa. • Scott Paper Company, Everett, Wash. • Standard Oil Co., Jamestown, North Dakota • U. S. Steel Corporation • Western-Electric Company, Pomona, N. C.

All of these nationally-known firms are famous for excellence in their particular fields, thus, it is no surprise to find that Miller Center Guided Check Valves are specified for dependability at their various installations. It will pay you well to investigate further.



. . . may be installed vertically

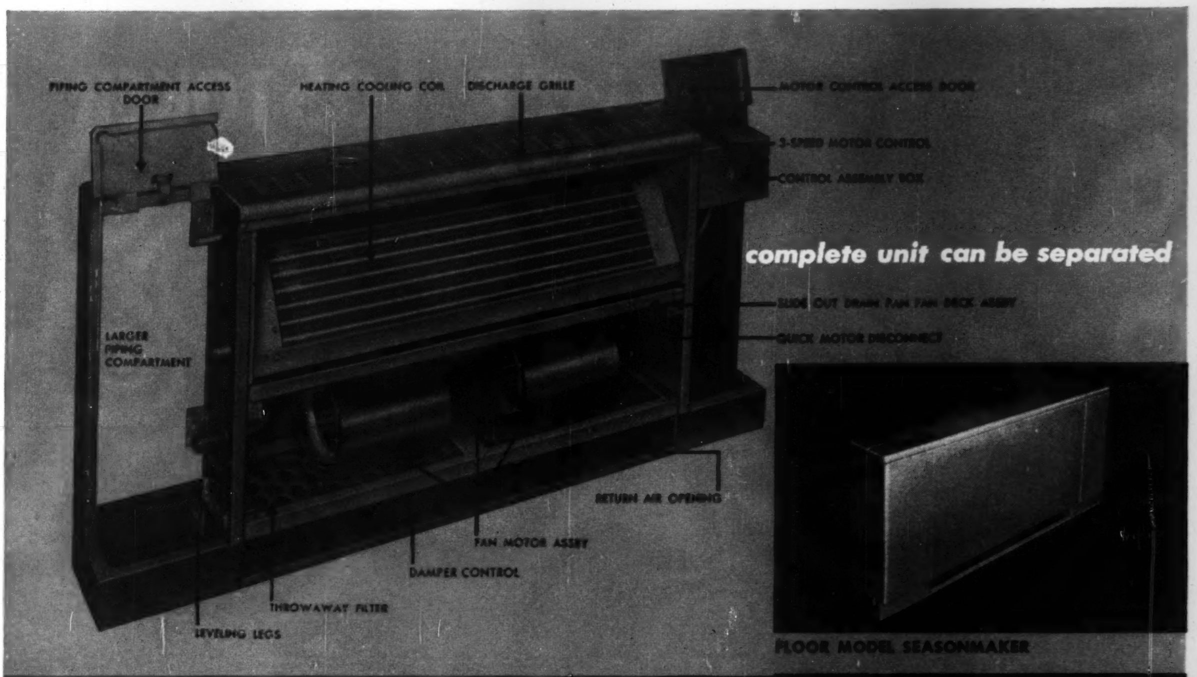
Miller has a size and style check valve for EVERY job, can be installed next to ANY fitting and in ANY position . . .horizontal, vertical, diagonal. . .frequently resulting in lower original installation costs.

or horizontally

WRITE US TODAY
FOR DESCRIPTIVE
LITERATURE . . .

miller
VALVE COMPANY, INC.

1620 PENNSYLVANIA AVE. • PITTSBURGH, PA.


PIPING COMPARTMENT ACCESS DOOR
HEATING COOLING COIL
DISCHARGE GRILLE
MOTOR CONTROL ACCESS DOOR
3-SPEED MOTOR CONTROL
CONTROL ASSEMBLY BOX
complete unit can be separated
SLIDE OUT DRAIN PAN FAN DECK ASSBY
QUICK MOTOR DISCONNECT
LARGER PIPING COMPARTMENT
RETURN AIR OPENING
FAN MOTOR ASSBY
DAMPER CONTROL
THROWAWAY FILTER
LEVELING LEGS
FLOOR MODEL SEASONMAKER

So Versatile, So Dependable ...and So Easy to Work With

McQuay
thin-line design
SEASONMAKER

McQuay thin-line design individual room Seasonmakers are popular, not only because of their convenient size, their high efficiency and their inherent quality, but because they are so extremely versatile and dependable. Every part is easily and quickly accessible. They are easy to install and easy to work with. For example, filters are easily changeable; the slide-out fan deck is quickly removable; the hand of coil is easily reversible in the field.

All McQuay Seasonmakers utilize central station heating and cooling and are available with capacities of 220, 330, 440, 520 and 640 cfm. They furnish individual room comfort at any desired temperature level—heated, filtered air in winter and cooled, dehumidified and filtered air in summer. Seasonmakers are ideal for multi-room buildings such as hotels, apartments, motels, schools, hospitals, offices and residences.

If you haven't already done so, investigate McQuay individual room Seasonmakers. For complete information call the McQuay representative in or near your city, or write McQuay, Inc., 1601 Broadway St. N. E., Minneapolis 13, Minnesota.

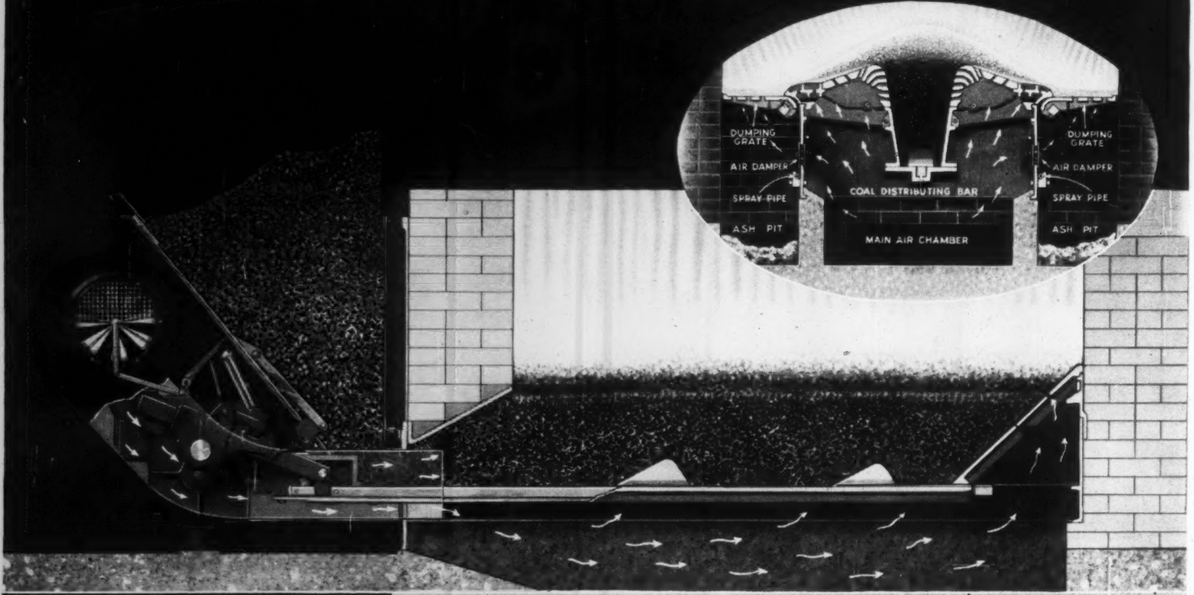
ONLY 8 1/2" THIN
25 INCHES HIGH

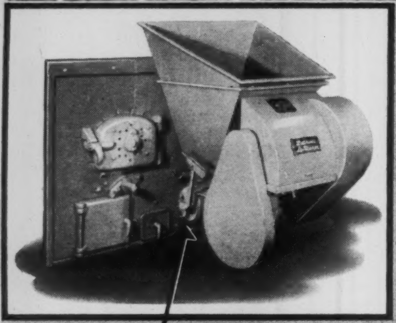
4 Models In 5 Sizes

McQuay INC.
AIR CONDITIONING • HEATING • REFRIGERATION

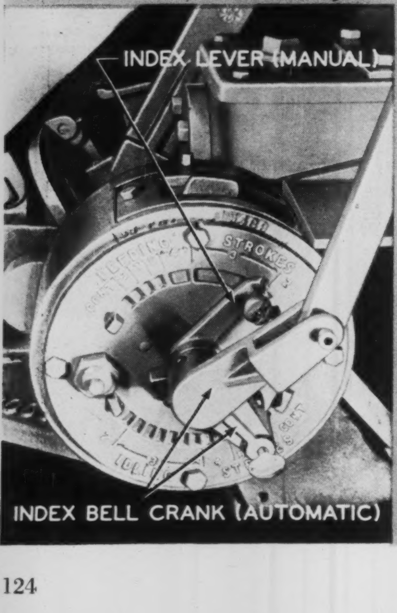
BURN COAL
the Modern Way
for Economy

DETROIT LOSTOKER


DUMPING GRATE
AIR DAMPER
SPRAY PIPE
ASH PIT
COAL DISTRIBUTING BAR
MAIN AIR CHAMBER
DUMPING GRATE
AIR DAMPER
SPRAY PIPE
ASH PIT



DETROIT ADJUSTABLE FEED


INDEX LEVER (MANUAL)
STROKES
INDEX BELL CRANK (AUTOMATIC)

Many Sizes—3,000 to 12,000 pounds steam per hour. Readily applied to new or old boilers. Save coal—eliminate smoke.

The Detroit LoStoker is a plunger type underfeed, mechanically driven, side cleaning stoker sturdily built for long trouble-free service.

LOSTOKER FEATURES INCLUDE:

PLUNGER FEED—Long experience has proved this to be the most dependable type of coal feed.

HEAVY DUTY, MECHANICAL DRIVE—Machine cut worms and gears, mounted in roller bearings, run in oil. Motor or steam turbine operated, requires little power.

HIGH TUYERES—Supply more air toward center of retort, reducing coking tendency, increasing burning rate and improving efficiency.

INTEGRAL FAN—Fan and stoker driven by a single motor or turbine. LoStokers are easy to install.

CONTROL—Thirty-two different coal feeding rates. Optional are "Start and Stop" or "Fully Automatic," with the "Adjustable Coal Feed Control." Air supply in either case is proportioned to coal feed.

BRICKSET or FIREBOX APPLICATIONS

LoStokers may be applied in brick setting to all types of water tube, tubular and firebox boilers. Where Furnace volume permits, a LoStoker may be installed directly in the firebox, without front and sidewall brickwork. LoStokers are only one of several types of our underfeed and overfeed spreader stokers.

Write for recommendations. No obligation.

DETROIT STOKER COMPANY

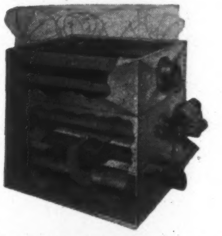
MAIN OFFICE AND WORKS • MONROE, MICHIGAN
District Offices or Representatives in Principal Cities

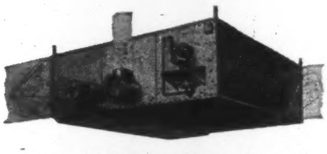
Campbell

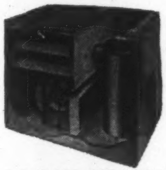
WARM AIR HEATERS FOR LARGE BUILDINGS

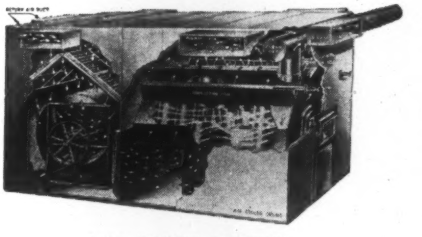
Campbell Heaters make it easy to use warm air heating in large buildings. Easy to install, compact, dependable and low in cost.

Our Engineering Department is at your service. Send us your preliminary plans and ideas and we will be glad to help you work them out.


HI-BOY UNIT HEATER


HORIZONTAL UNIT HEATER


LO-BOY HEATER


8000 *SERIES HEATER*

SPECIFICATIONS and DIMENSIONS

Hi Boy & Horizontal Unit Heater—Oil & Gas for Churches, Schools, Commercial & Industrial Buildings

HEATER				BLOWER‡			MAX. FUEL RATE§				DIMENSIONS		
Unit No. •	Output Capacity BTU/Hr. †	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	Normal cfm 140° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs Per Hr.	H in.	L in.	W in.
U225	225,000	84	2700	2750	½	½	2.0	280	2.8		66	48	23
U275	275,000	84	3300	3350	½	¾	2.5	350	3.5		66	48	23
U325	325,000	121	2700	4000	½	¾	2.9	400	4.0		72	54	29
U400	400,000	121	3300	4900	½	1	3.6	500	5.0		72	54	29
U500	500,000	182	2750	6100	½	1	4.5	625	6.3		84	60	34
U600	600,000	182	3300	7300	½	1½	5.4	750	7.5		84	60	34
U700	700,000	244	2850	8500	½	2	6.2	875	8.8		99	78	40
U800	800,000	244	3300	9800	½	2	7.2	1000	10.0		99	78	40
U950	950,000	334	2850	11,600	½	3	8.5	1200	12.0		108	96	48
U1100	1,100,000	334	3300	13,500	½	3	9.8	1375	13.8		108	96	48
U1300	1,300,000	455	2850	16,000	½	3	11.6	1625	16.3		126	114	54
U1500	1,500,000	455	3300	18,500	½	5	13.4	1875	18.8		126	114	54

Lo Boy Oil & Gas Fired for Large Residences, Small Churches, Schools, etc.

HEATER				BLOWER‡			MAX. FUEL RATE§				DIMENSIONS		
Unit No. •	Output Capacity BTU/Hr. †	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	Normal cfm 140° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs Per Hr.	H in.	L in.	W in.
H200	235,000	100	2350	2600	½	½	2.1	293	2.9		52	75	41
H250	275,000	125	2200	3300	½	¾	2.5	344	3.4		57	85	41
H300	340,000	136	2500	4000	½	¾	3.0	425	4.2		61	87	50
H350	400,000	152	2600	4600	½	1		500	5.0		61	87	50
H400	450,000	167	2700	5300	½	1½	4.0	560	5.6		61	87	50
H500	500,000	200	2750	6600	½	1½	4.5	625	6.2		74	91	60
H600	650,000	240	2700	8000	½	2	5.8	810	8.1		76	97	60
H700	750,000	280	2700	9200	½	2	6.7	940	9.4		72	104	80

8000 Series Oil, Gas, Stoker or Hand Fired For Large Schools, Churches, etc.

HEATER				BLOWER‡			MAX. FUEL RATE§				DIMENSIONS		
Unit No. •	Output Capacity BTU/Hr. †	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	Normal cfm 140° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs Per Hr.	H in.	L in.	W in.
8032	400,000	133	3000	5300	½	1.0	3.6	500	5.0	45	66	94½	51
8046	500,000	167	3000	6600	½	1½	4.5	625	6.3	56	66	105	51
8060	600,000	200	3000	8000	½	1½	5.4	750	7.5	67	66	126	51
8074	700,000	233	3000	9200	½	1½	6.3	875	8.8	78	66	134	51
8075	840,000	280	3000	11,000	½	2	7.5	1050	10.5	100	80	140	76
8100	960,000	320	3000	12,500	½	2	8.6	1200	12.0	114	80	157	76
8125	1,080,000	360	3000	14,100	½	2	9.7	1350	13.5	129	80	180	76
8150	1,320,000	440	3000	17,300	½	3	11.8	1650	16.5	157	80	198	76
8175	1,440,000	480	3000	18,900	½	3	12.9	1800	18.0	171	80	210	76
8200	1,800,000	600	3000	23,600	½	5	16.1	2250	22.5	214	100	227	94
8250	2,250,000	750	3000	29,500	½	5	20.1	2810	28.0	268	100	252	94
8300	2,700,000	900	3000	35,400	½	5	24.1	3380	33.8	320	118	268	104
8350	3,150,000	1050	3000	41,300	½	7½	26.1	3940	39.4	375	118	268	114

† Based on 80% thermal efficiency for oil and gas and 70% for coal. Add 10% to 35% over calculated heat loss for pick-up load and 10% to 15% for duct radiation losses. The higher figure is preferable for best operating economy and life of the equipment.

‡ For other air volumes and static pressures consult our Engineering Department.

§ An induced draft blower can be furnished if a stack or chimney is not available. The gas passages of the heaters are adequate so an induced draft blower is not ordinarily needed.

For Complete Specifications, See *Sweet's Catalog Service*

CAMPBELL HEATING COMPANY

Des Moines 17, Iowa

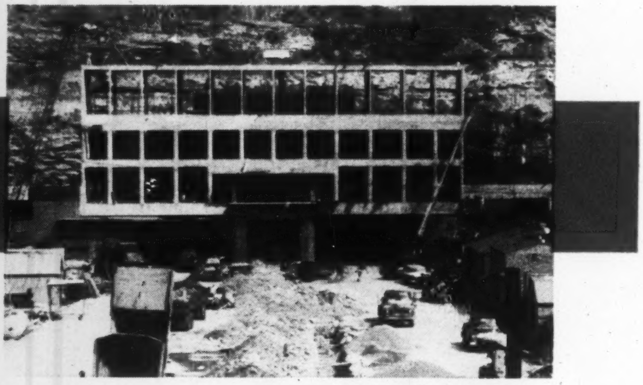
In Pittsburgh's new Fort Pitt Tunnel, Bayley fans were chosen for ventilation

Bayley fans were chosen for placement at both ends of the new Fort Pitt Tunnel.

Why Bayley? The engineers might have considered the 35 years of trouble-free service delivered by Bayley fans in the Liberty Tunnel in Allegheny County.

There are ten Bayley Type AP Series 4 fans to be installed in the Fort Pitt Tunnel.

Here is the Bayley Type AP Series 4 Fan



Here is the new Fort Pitt Tunnel

Four Bayley Type AP Series 4, DW-DI, 108¾" wheel diameter fans to be installed at each end of the tunnel.

ONE END: Four fans—326,600 CFM, each at 3.0" S.P., 294 RPM, Motors 200 HP, chain drive.

OTHER END: Four fans—264,500 CFM, each at 1.99" S.P., 239 RPM, Motors 100 HP, chain drive.

ONE TUNNEL EXHAUST FAN AT EACH END on Emergency Standby—DW-DI, 98¼" wheel diameter, 300,000 CFM, each at 1.5" S.P., 320 RPM, Motors 150 HP, direct drive.

When you want a job well done, it's good sense to call Green.

Green-Bayley BLOWER DIVISION

THE GREEN FUEL ECONOMIZER CO., INC.

BEACON 3, NEW YORK

ALCO *the one complete line of* REFRIGERANT CONTROLS

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for all refrigerants from 1/4 to 200 tons

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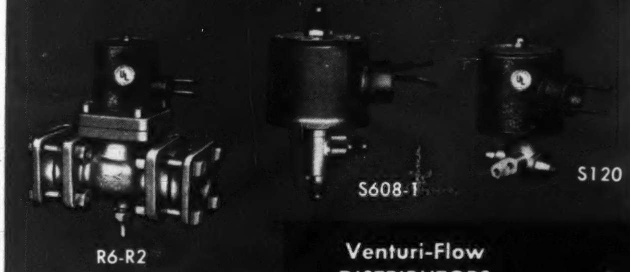
Sizes & Type for every application and refrigerant



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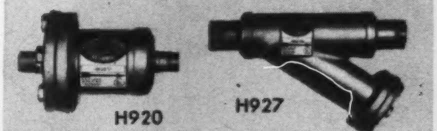
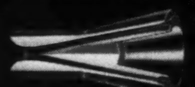
maximum Screen area—
Sizes & Type for every application



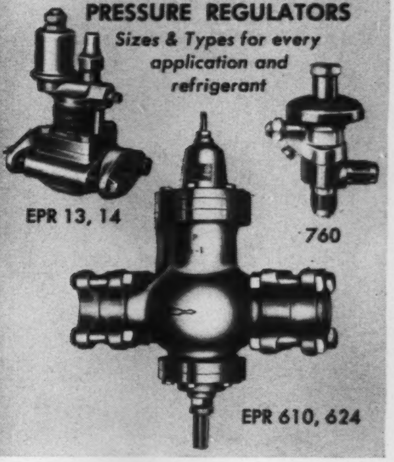
Venturi-Flow DISTRIBUTORS



wide application . . . low pressure drop . . . any position . . . one-piece construction . . . no nozzles

Float SWITCHES
for trouble free liquid level control

EVAPORATOR PRESSURE REGULATORS
Sizes & Types for every application and refrigerant



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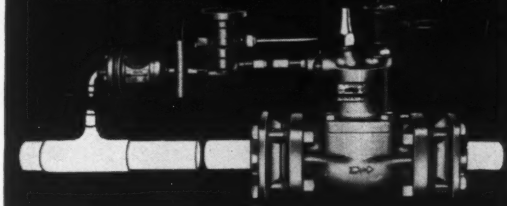
with integral solenoid stop . . . for larger installations



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the one complete line designed and engineered for efficient trouble free performance.

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- *BUY QUALITY*
- *BUY ALCO*

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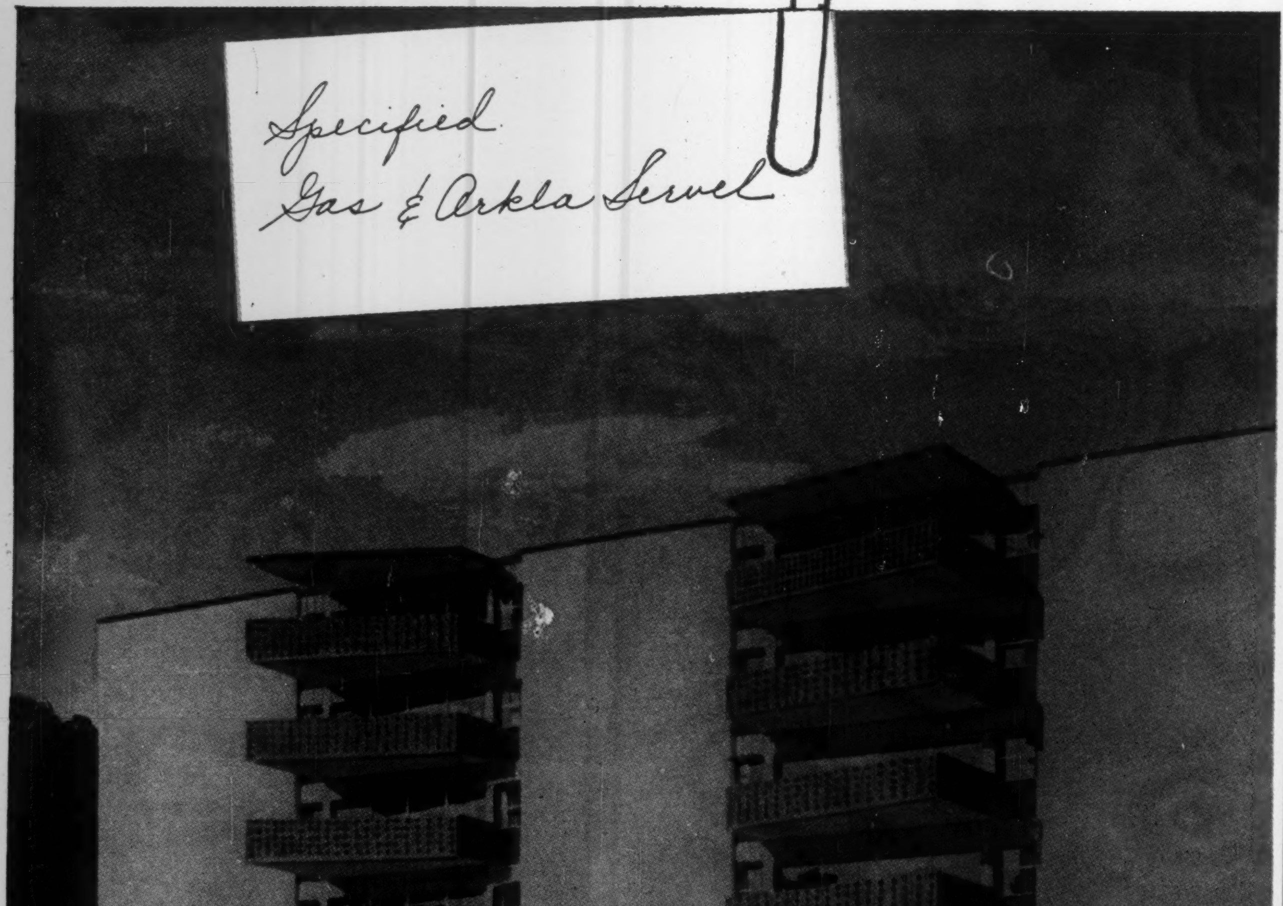
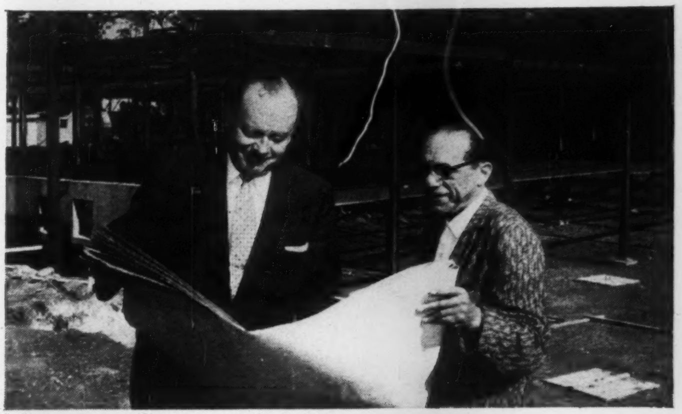
The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves


Specified
Gas & Arkla Servel

Builder: Sugar Brothers • Designer: Matthew J. Rosenstock and Associates • Consulting Architect: Eugene F. Peddle, A. I. A.



Harry Sugar (left), one of the builders, and designer Matthew J. Rosenstock

Individual **GAS** *units to cool and heat new $2 million apartment house*

Akron's 7-story Carlton House to be cooled with individual Arkla-Servel units

Akron's luxurious Carlton House will mark the largest use of individual gas air conditioning units in a single apartment house.

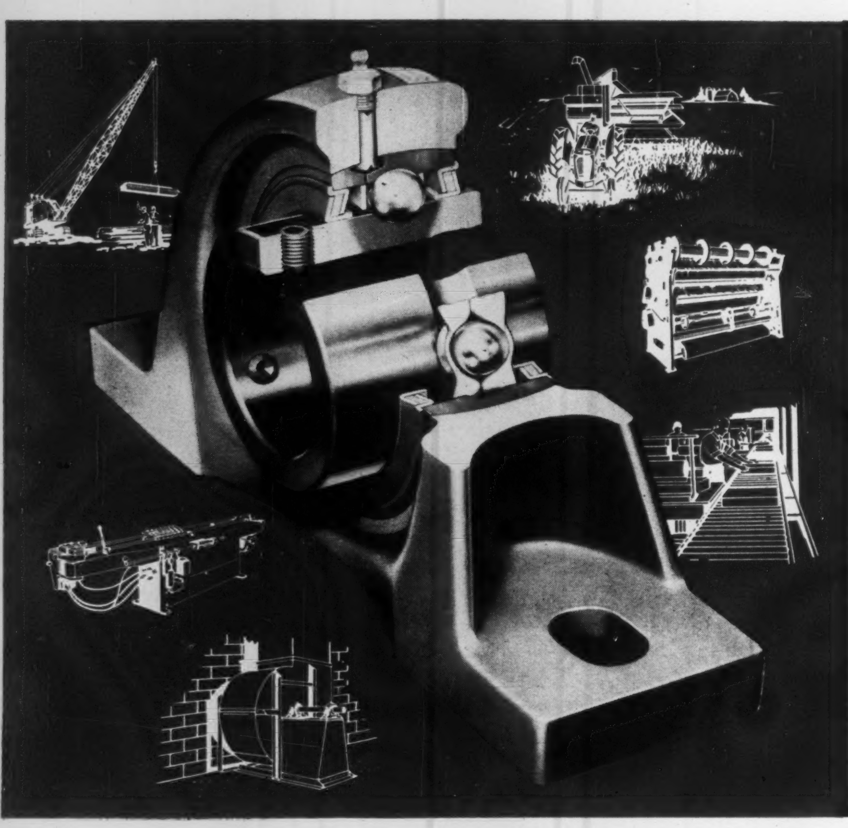
Summer cooling and winter heating will be provided for the suites by 58 three-and-a-half and five ton Arkla-Servel Sun Valley gas air conditioners.

The Arkla-Servel gas air conditioning units were chosen after serious consideration of all types available. The designer insisted that each apartment have individual thermostat control as well as individual installations to eliminate the need for large compressors and any possible vibration. Because gas is also used for cooking as well as heating and cooling, there was no need for installing heavy cable, either.

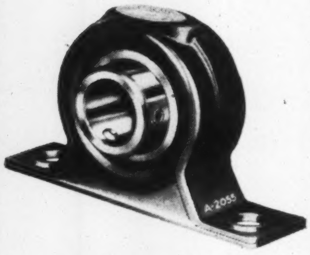
The Arkla units will be installed in the utility rooms of each suite. Four small water towers, located on the roof, will provide condensing water for the system. The water will be constantly recirculated, thus keeping its cost at a minimum.

Check the facts and you too will see that modern Gas air conditioning out-performs all others. For specific details call your local Gas Company's air conditioning specialist, or write to the Arkla Air Conditioning Corporation, General Sales Office, 812 Main Street, Little Rock, Ark. *American Gas Association*

for Cooling, **GAS** *is Good Business*



"LP" PILLOW BLOCK



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SEALMASTER®

. . . quality that builds acceptance!

There is no greater assurance of performance than quality. SEALMASTER gives you that quality in a complete line of ball bearing units, providing a wide range of mountings in shaft sizes from $\frac{1}{2}$" to $4\frac{15}{16}$".

Patented SEALMASTER "Zone Hardening" affords simplified, secure locking to shaft. One piece housings eliminate loose pieces that increase your assembly costs. And when cost is a primary requisite there's no need to sacrifice quality.

The new SEALMASTER "L" Series provides a precision, low-cost line of self-aligning ball bearing units. They are permanently sealed and pre-lubricated with a high grade lubricant for long life.

SEALMASTER rubber mounted units provide extremely quiet operation where noise is an important factor.

Whatever you look for in a bearing unit — quality — performance — economy — there's nothing comparable with SEALMASTER!

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BALL BEARING UNITS

SEALMASTER BEARINGS

A DIVISION OF

STEPHENS-ADAMSON MFG. CO.

47 RIDGEWAY AVE., AURORA, ILL.

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TYPE L
BREIDERT air-x-hauster
A.I.A. File No. 12K2
Engineering Data No. 60-1
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air-x-hauster
powair-x-hauster
SAFE, SURE VENTILATION NO MATTER WHICH WAY THE WIND BLOWS
THE G. C. BREIDERT CO.
type L
type H
type BWS
type BWR
type FWS
type SG
type CON
BASES for use with TYPE L BREIDERT air-x-hausters
type L
TYPE RG AND LG
BREIDERT air-x-hausters
TYPE RG
SPECIFICATIONS — TYPE RG
TYPE SG SQUARE GRAVITY
BREIDERT air-x-hauster

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We have just completed our new 52-page Engineering Data Book which contains detailed information on all Breidert ventilators, their capacities, specifications, applications and other data. It belongs in your file—just mail us the coupon below for a free copy.

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P. O. Box 1190, San Fernando, California

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G. C. BREIDERT CO.
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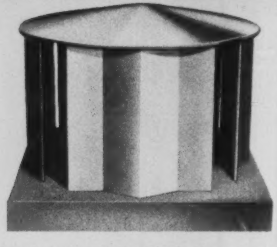
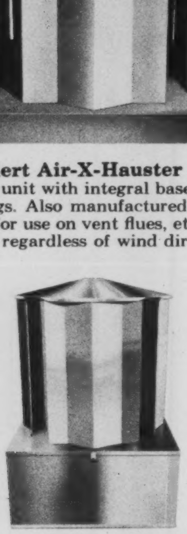
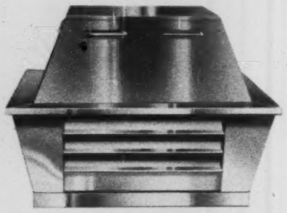


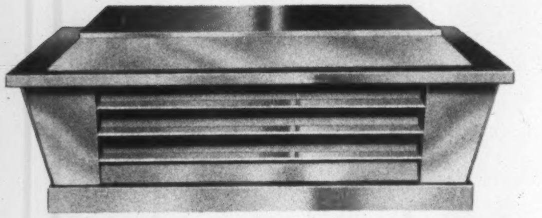
Type F Breidert Air-X-Hauster . . . very low silhouette gravity unit with integral base for use on commercial buildings. Also manufactured in Type L unit (round collar) for use on vent flues, etc. Provides positive ventilation regardless of wind directions.



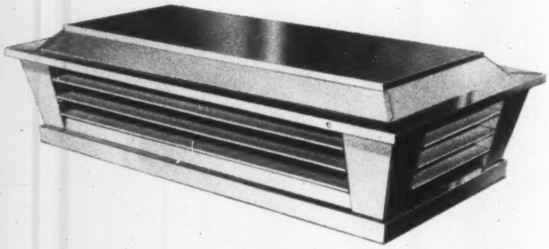
Type H Breidert Power Roof Ventilator . . . provides both gravity and power ventilation. Particularly adaptable where power ventilation is not always needed, such as on auditoriums, offices, warehouses, restaurants, etc. In many instances, the gravity ventilation alone, particularly during winter, effects savings in power costs.



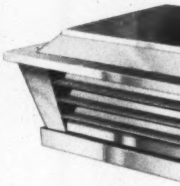
Type BWS Square Breidert Powair-X-Hauster . . . for schools, warehouses, hospitals – wherever static pressures are encountered and ductwork is used. Provides high CFM capacities against static resistance, also limited gravity ventilation when power unit is off.



Type BWR Breidert Powair-X-Hauster . . . the ultimate in low silhouette, engineered for use where high static pressures exist and ductwork is necessary. Horizontal discharge. Ideal for exhausting stale air and non-corrosive fumes, such as in bowling alleys, schools, gyms, barns, etc.



Type BWD Breidert Powair-X-Hauster . . . two exhaust systems in one unit, designed for duct installations requiring two exhausts at separate locations (such as adjoining restrooms). Modern, low design in conformance with today's architectural and engineering requirements.



Type PBW Br
provides a suppl
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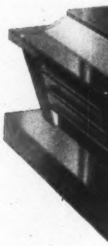
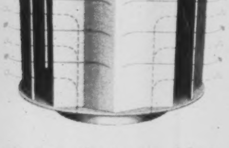


Type SG Squ
Hauster . . . att
offering high gr
without ductwork
ing gravity ventil

Safe, Sure Ventilation for Every



More than 20 years ago, the G. C. Breidert Co. introduced the first scientific improvement in roof ventilators developed in over a half century – the aerodynamically-designed Breidert Air-X-Hauster gravity ventilator that provides safe, sure ventilation no matter which way the wind blows (barring interior negative pressure). Then came the Breidert Powair-X-Hauster power unit utilizing the same high efficiency design to provide greater capacities.

Specialized Ventilators Come of Age!

Now, with the experience gained through years of leadership in the design and engineering of better ventilators, the Breidert Co. has developed a complete line of new low, square and rectangular Breidert units, gravity and power.

TEAR HERE FOR PERMANENT FILE.

All of these units were designed specifically in response to the growing demand of architects for ventilators with lower and lower silhouettes, and for designs that are compatible with square and rectangular buildings.

Years Ahead in Design...Operating Simplicity...Efficiency

The new Breidert units are downdraft-proof and water-proof barring interior negative pressure, regardless of wind or weather conditions. All units are structurally designed for utmost strength and rigidity. There is a Breidert ventilator for every need – on every type of building:

FACTORIES, SHOPS, FOUNDRIES, STORES AND RESTAURANTS
LAUNDRIES AND DRY CLEANING PLANTS, PRINTING PLANTS
RESIDENCES AND BARNS, WAREHOUSES AND GARAGES
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ENGINE AND BOILER ROOMS . . . AND MANY OTHERS

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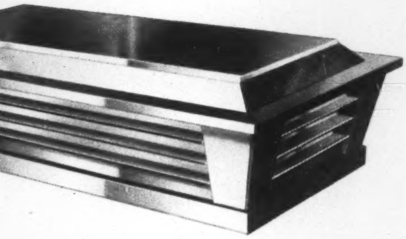
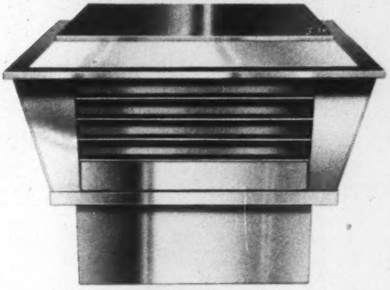
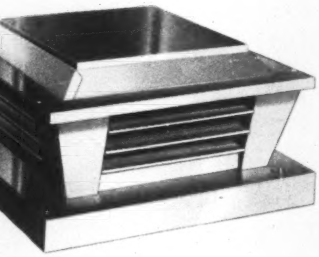


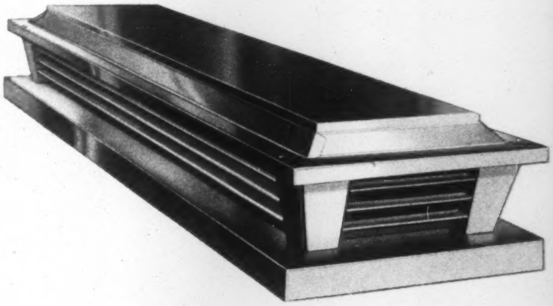
V Breidert Powair-X-Hauster...
supply and exhaust in same low silhouette,
unit. Designed especially for installations
sh air inlet is necessary (inside room appli-
lassrooms, restrooms, supply rooms, etc.



Type FWS Breidert Powair-X-Hauster... achieves its extremely low silhouette by suspending the fan assembly below the curb. With horizontal discharge, build-up of back-pressure is eliminated. Two models: FWS-E for exhaust, FWS-S for supply. Ideal where lowest possible silhouette is desired... laboratories, classrooms, auditoriums, etc.



Square Gravity Breidert Air-X-
. . attractive, extremely low silhouette unit
h gravity capacity for roof installations
twork. *Available with translucent top, mak-*
ventilator and skylight ventilation.



Type CON Breidert Air-X-Hauster ... designed for mounting on roof ridge, the Type CON provides a continuous gravity unit for any length vent. Long, low, modern design makes it compatible with any style of building. Available with translucent top. Particularly adaptable for use as gravity ventilator and skylight on warehouses, factories, etc.

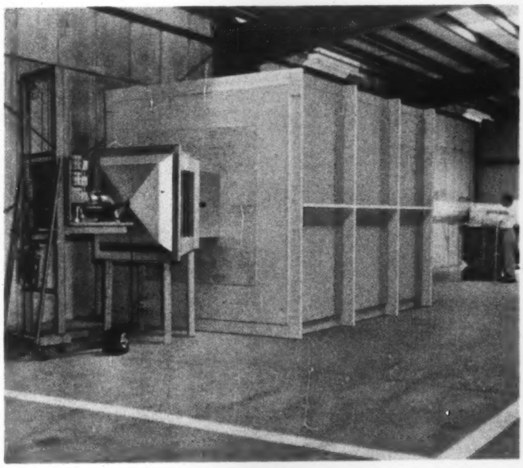
y Ventilating Problem

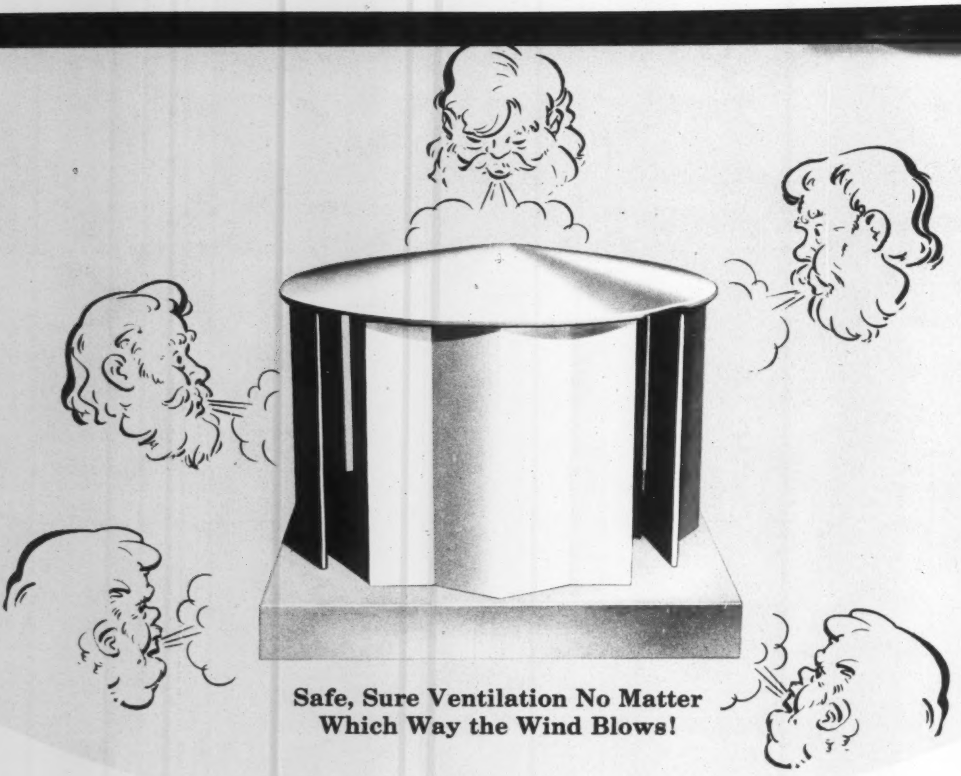
) CAPACITIES... Breidert tests for pub-
s of gravity units are conducted under the
ision of the Smith Emery Co., the west
ng independent testing laboratory. *Results*
tified.
Breidert Company certifies that products
.M.C.A. Rating Seal have been tested and
rdance with A.M.C.A. Bulletin 110, Test
Plate VA (which applies only to units with 12-inch and larger wheel diameters). Smaller units were tested by nozzle chamber method.

U.L. APPROVAL ... Check Underwriters' Laboratories Inc. Re-examination Service.

CANADA... Approved by CSA Testing Laboratories.

RIGHT: *Dynamometer tests being conducted on a Breidert Type FWS power unit. All types of Breidert Powair-X-Hausters undergo complete performance tests in the A.M.C.A. approved Breidert laboratory.*





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air-x-hauster®

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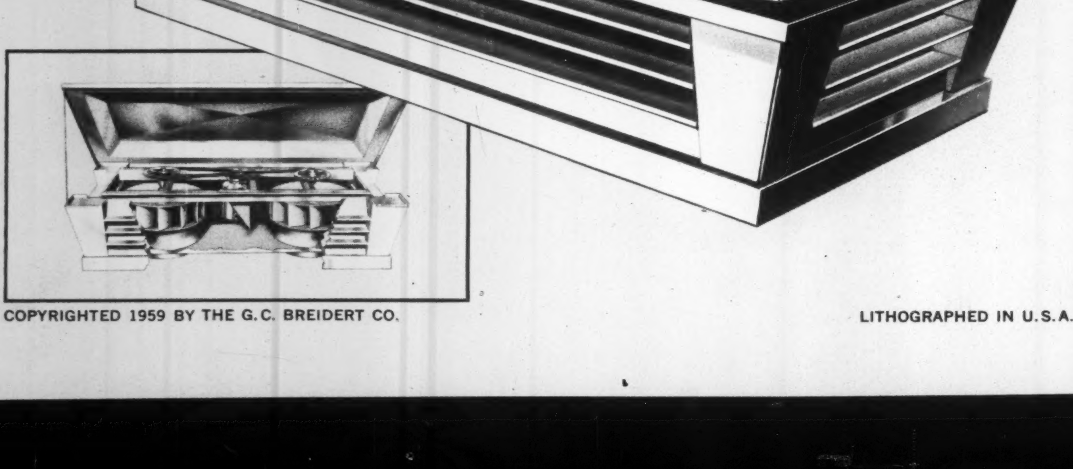
powair-x-hauster®

20 YEARS *of Ventilation Achievement*



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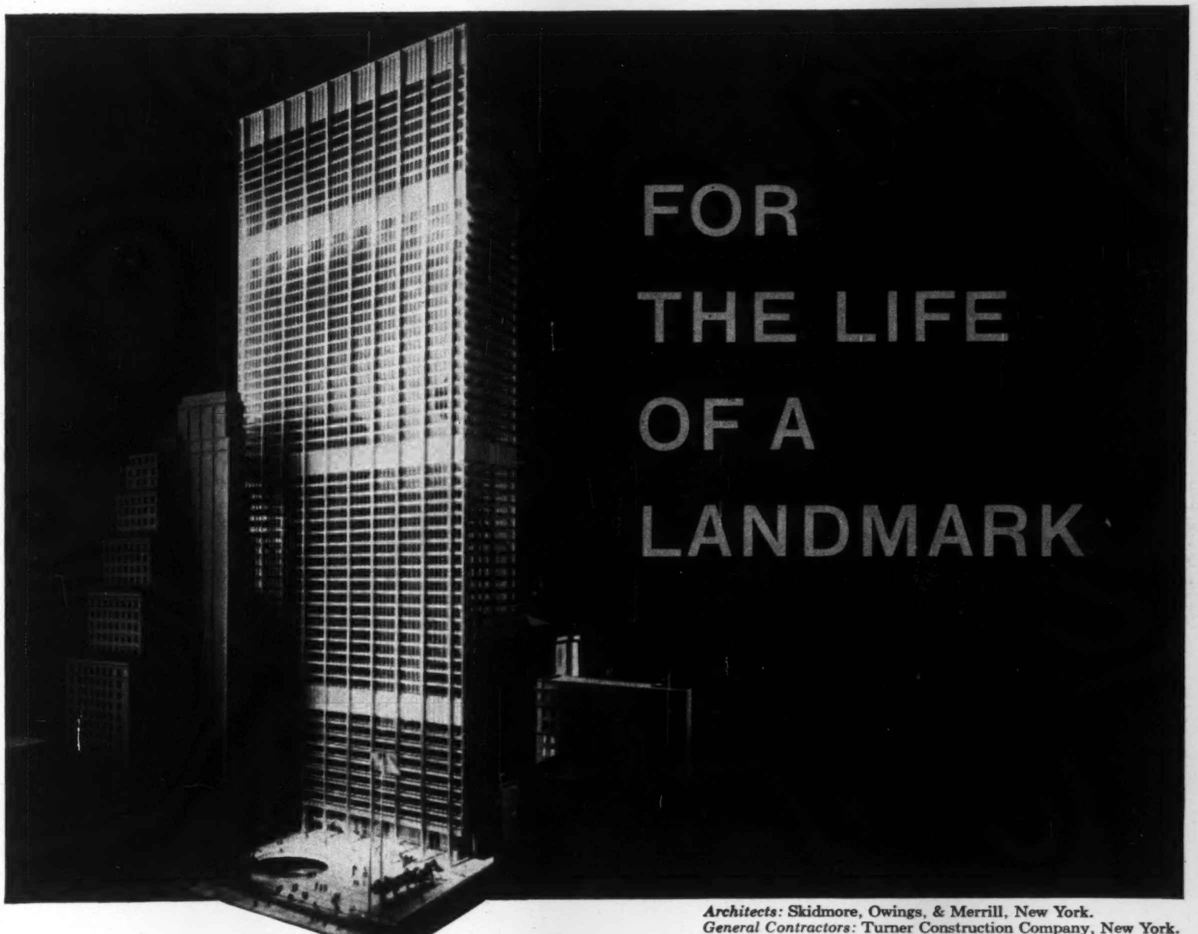


Architects: Skidmore, Owings, & Merrill, New York.
General Contractors: Turner Construction Company, New York.

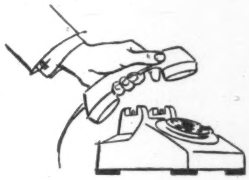
Long-term dependability...200 tons of galvanized steel pipe being installed in New York's Chase Manhattan Building

By completion early in 1960, hundreds of thousands of feet of galvanized steel pipe for waste and vent lines will have been installed in this new, lower Manhattan landmark. *Steel*—because low-cost steel pipe is good for the life of any building. Over 90% of it *Republic*—because Eugene Duklauer, Inc., Plumbing Contractors—demand steel pipe with the highest possible degree of workability.

Republic's constant quality control guarantees that workability. You enjoy easier bending, threading, cutting, and welding. What's more, you can rely on the great strength of steel for long, unsupported runs; on the availability of steel for dependable delivery; on the tight, galvanized coating of Republic Steel Pipe for stubborn resistance to corrosion, and for easy fabrication.

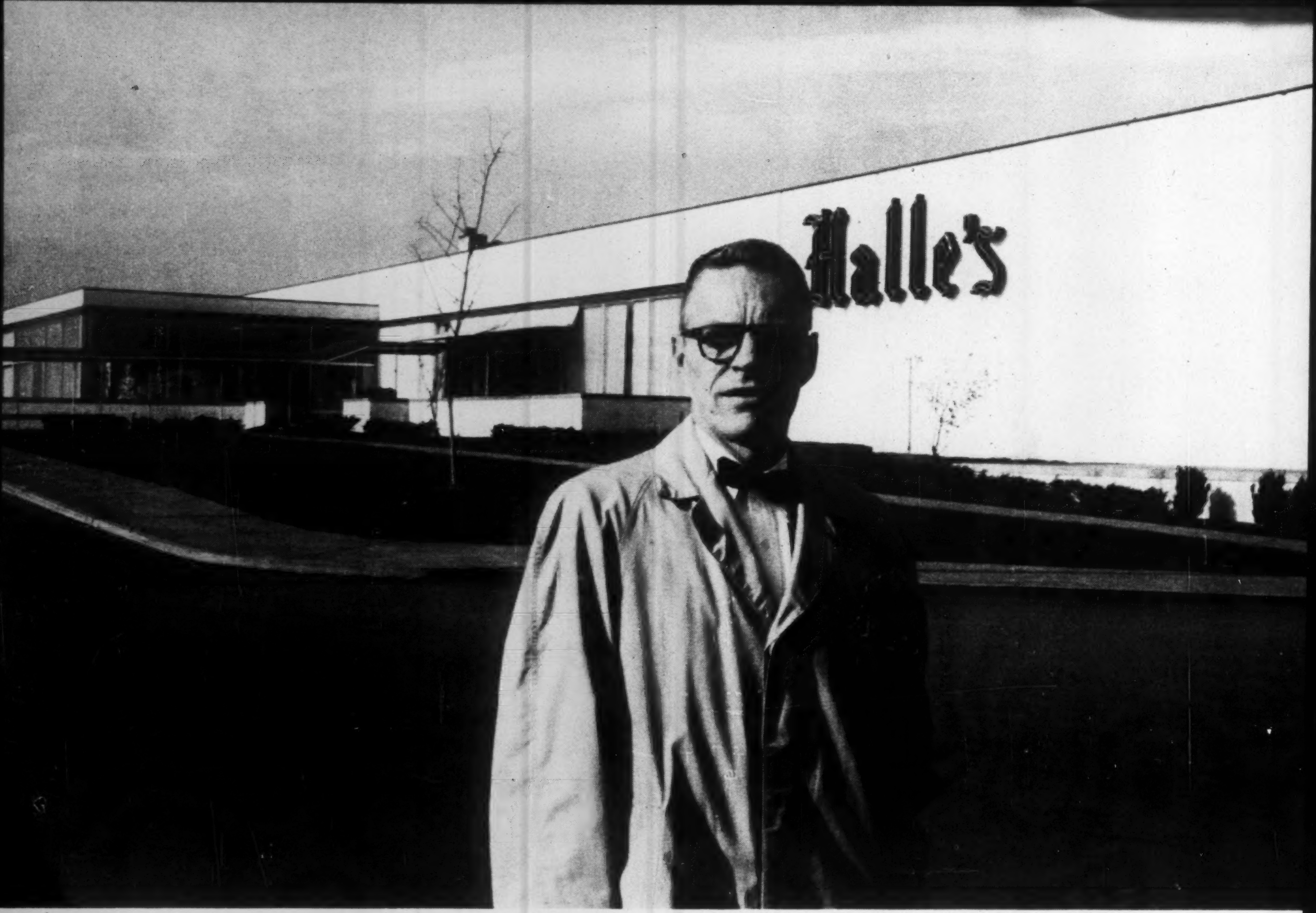
See for yourself! Your Republic distributor has complete information on the immediate and long-term savings offered by Republic Steel Pipe. Call him today or write to Republic Steel Corporation, Dept. HP-8304, 1441 Republic Building, Cleveland 1, Ohio.

INSIST ON PIPE MADE IN U.S.A.



CALL YOUR LOCAL REPUBLIC DISTRIBUTOR FOR QUICK DELIVERY OF STEEL PIPE

REPUBLIC Steel Pipe



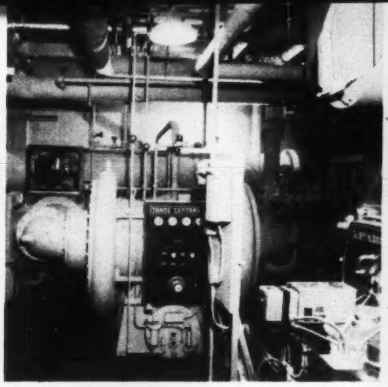
J. L. VanNort, Midwest Regional Sales Manager. Shoppers are cool and comfortable in Halle's modern store in suburban Cleveland, Ohio, which utilizes two 200 hp. Reliance Hermetic Refrigeration Motors that drive two-stage centrifugal compressors.

"Duty Master *has* what air conditioning customers expect in a motor... uninterrupted, trouble-free operation

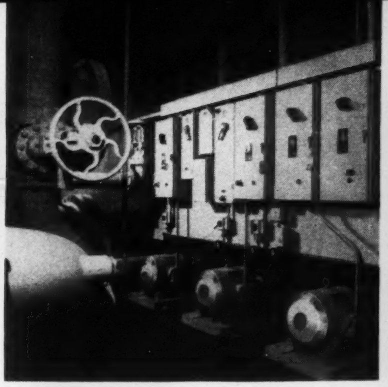
"The new Duty Master A-c. Motor has all the inherent design characteristics that keep it operating when you need it most. There's a Duty Master built for *every phase* of an air conditioning system . . . from the giant Hermetic motors to rough, outdoor applications. Many of the reasons for Duty Master's adaptability to this field stem from its qualities of built-in protection. So you get the benefits of low maintenance and *uninterrupted service.*

"Our Reliance engineers work constantly with equipment builders, consulting engineers, contractors and end users . . . to come up with sound applications of Duty Master Motors that completely match their needs."

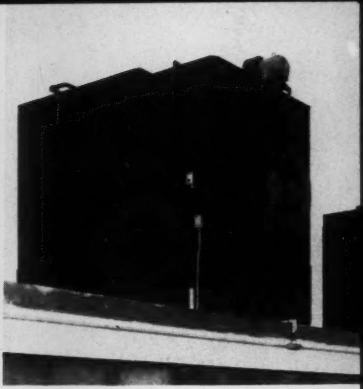
RELIANCE - R - Duty Master A-C. MOTOR



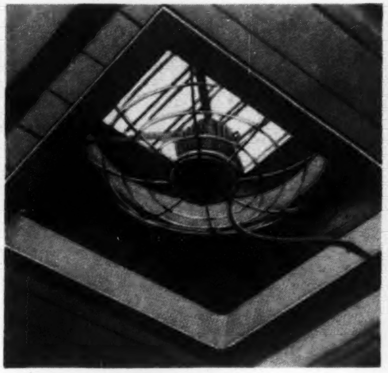
Centrifugal Compressors



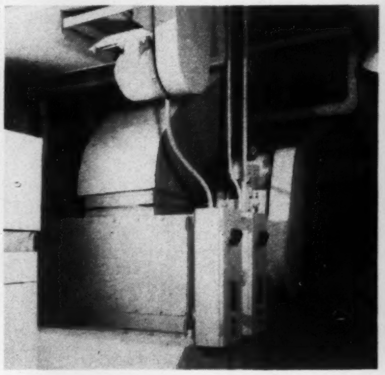
Chilled Water Pumps



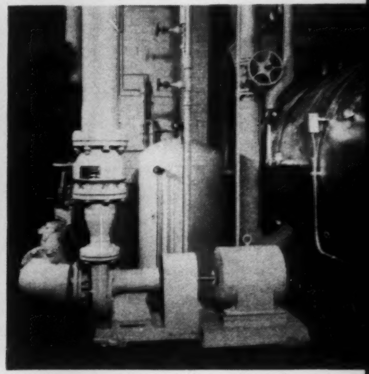
Cooling Towers



Exhaust Fans



Air Handling Equipment



Boiler Feed Water Pumps

Duty Master: electrical stamina—mechanical strength

The pictures of other installations tell the story of Duty Master's full-system service. Vitally important is the Hermetic Lecton*-insulated Refrigeration Motor, driving a centrifugal compressor. It repels freon, oil, water and heat . . . retains dielectric strength and resists flaking. Cuts maintenance and uncomfortable downtime. Accelerated 5-year tests show no insulation deterioration or breakdown, even when motor is operated continuously at 300°F! It's available from 10 to 1000 hp.

In other applications shown, the quiet Duty Master does a competent, uninterrupted job. It is not affected by dust, dirt or moisture. Multiple-dipped insulation, plus metered lubrication system (Metermatic) give you the built-in protection so necessary for efficient operation. Maintenance is at a minimum.

For special applications, such as gas absorption systems, the Reliance Submersible Motor can be safely immersed in water, oil, or liquid chemicals, in this case lithium bromide. Exclusive Reliance "Liqui-Seal" construction seals oil in, foreign contaminants out.

Reliance gives you a wide variety of modifications for any air conditioning application . . . pump-mount adaptors, vertical NEMA C-Face and D-Flange motors, P-Base motors . . . in all enclosures. Duty Master A-c. Motors are now available, ready to ship, in 1 through 250 hp. ratings.

Your nearest Reliance Sales Engineer or distributor can show you why the Duty Master line is so completely suited to your air conditioning requirements. Call him. If you choose, write for detailed information—Bulletins B-2507 and B-2505.

B-1649

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*DuPont Registered Trademark

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

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Canadian Division: Toronto, Ontario
Sales Offices and Distributors in Principal Cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

YOUR GUIDE TO GREATER FLEXIBILITY IN COOLING TOWER DESIGN

Phillips

NEW

No one design solves all cooling tower problems—but the complete PHILLIPS line does. No matter what the specifications, you'll find the answer in PHILLIPS Custom Engineered Cooling Towers.

Put PHILLIPS . . . the cooling tower specialists with unrivaled experience to work on your next job. You'll like the results.

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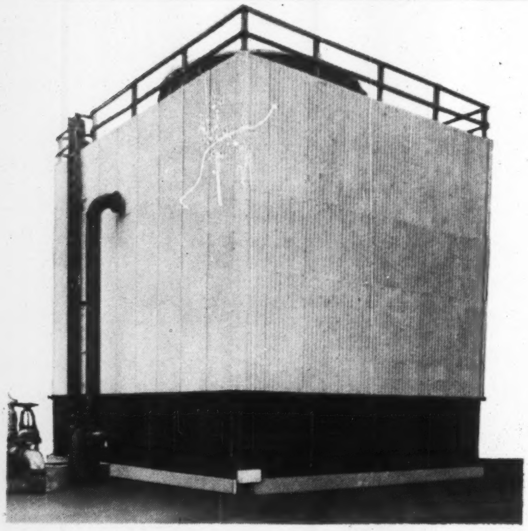
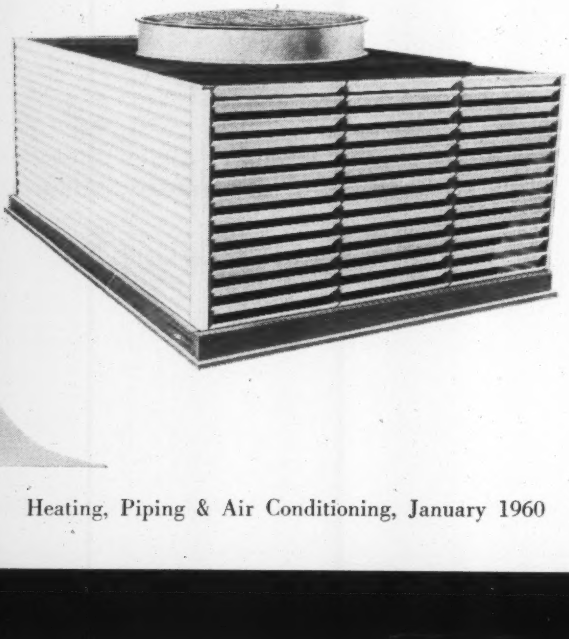
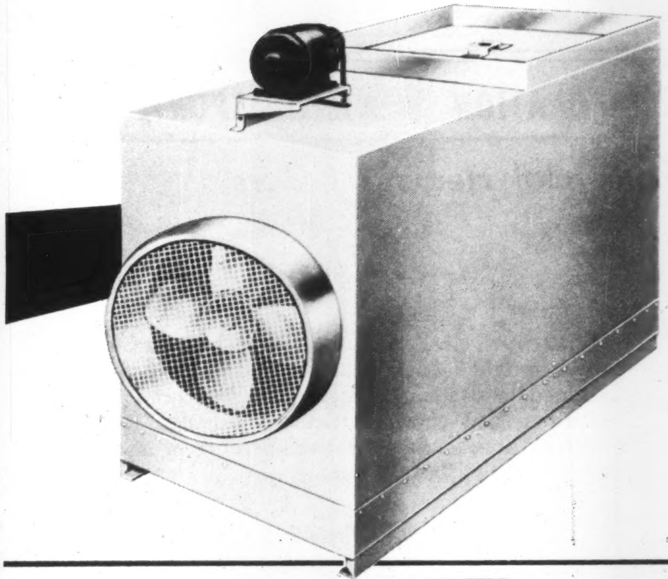
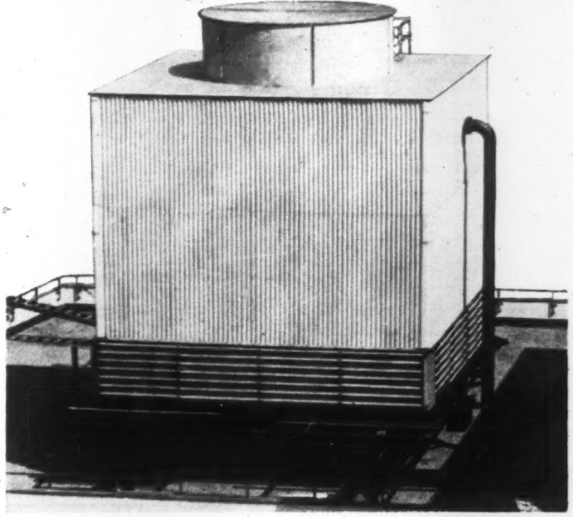






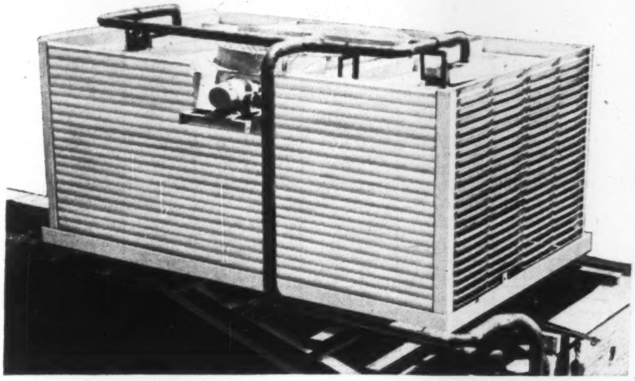
PACKAGED STEEL COOLING TOWER

A hot dipped galvanized steel packaged cooling tower with capacities from 3 to 60 tons, incorporating all the excellent engineering features as found in Phillips larger models. Available for delivery this cooling season.



COUNTERFLOW

Offers a custom engineered tower to meet any space condition. Proven design offers maximum capacity for minimum expense.



DUAL AIRSTREAM

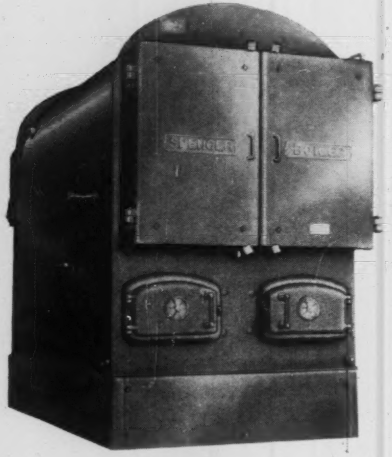
Phillips Cooling Tower Company continues to manufacture its dependable low height design, obtaining maximum performance from minimum height.

SPENCER HEATER *AVCO CORPORATION • WILLIAMSPORT, PA.*

The Quality Line of Commercial Heating Boilers

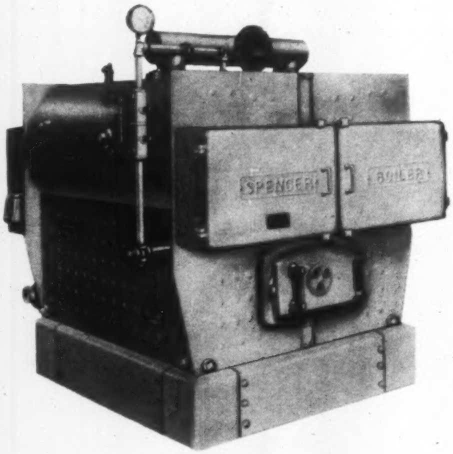
"A" SERIES

A rugged, tough commercial and industrial heating boiler designed for fast steaming and efficient operation. All sizes available with front head cuts for low-set installations and with storage or instantaneous service water coils.



"LW" SERIES

A patented, divided low-waterline boiler made in two watertight sections that need no welding on job. Designed to overcome problems in low head room, excavation and entry. Particularly adapted for replacement installations. Available with front head cut for extra low-set installations.



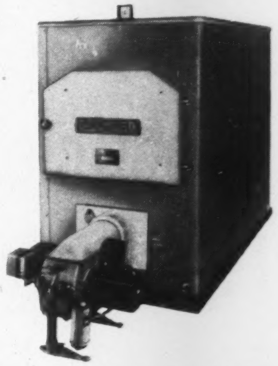
"A" SERIES - DIMENSIONS					CAPACITIES - S.B.I. RATINGS				"LW" SERIES DIMENSIONS				
Width	Shell Length	* Height	Water Line	Boiler Model	Gross Output MBH	Net Output MBH	Net Sq. Ft. Steam	Net Sq. Ft. Water	Boiler Model	*** Width	Shell Length	** Outlet Height	Water Line
					792	598	2,490	3,980	LW22	48	54½	54¾	40
					936	703	2,930	4,690	LW26	48	64½	54¾	40
					1,080	814	3,390	5,420	LW30	48	74½	54¾	40
42	59½	69¼	58¼	3M35	1,260	946	3,940	6,300	LW35	60	58¼	59¾	43¾
42	68	69¼	58¼	3M40	1,440	1,080	4,500	7,200	LW40	60	66¾	59¾	43¼
42	76½	69¼	58¼	3M45	1,620	1,217	5,070	8,110	LW45	60	75¼	59¾	43¾
48	71	70¾	59⅜	4M50	1,800	1,354	5,640	9,020	LW50	70	58¾	66¾	50
48	85	70¾	59⅜	4M60	2,160	1,622	6,760	10,820	LW60	70	70½	66¾	50
55	77	78½	66	5M70	2,520	1,891	7,880	12,610	LW70	70	82-0	66¾	50
55	93	78½	66	5M85	3,060	2,299	9,580	15,330	LW85	80	79½	74¾	55¾
60¾	80	89¼	74¾	6M100	3,600	2,702	11,260	18,020	LW100	80	94½	74¾	55¾
60¾	99	89¼	74¾	6M125	4,500	3,374	14,060	22,500	LW125	85	98½	81¾	62¾
66¾	95	101	86⅜	7M150	5,400	4,051	16,880	27,010	LW150	85	118¼	81¾	62¾
66¾	110	101	86⅜	7M175	6,300	4,726	19,690	31,500	LW175	95	107½	90¼	70
72¾	100¾	116½	101¼	8M200	7,200	5,402	22,510	36,020	LW200	95	122¾	90¼	70
72¾	124¾	116½	101¼	8M250	9,000	6,751	28,130	45,010	LW250	110	106½	107¾	85⅞
78¾	128	133½	115½	9M300	10,800	8,100	33,750	54,000	LW300	110	127¾	107¾	85⅞
78¾	148	133½	115½	9M350	12,600	9,449	39,370	62,990	LW350	110	149-0	107¾	85⅞

* "A" Series Height from bottom of water leg.

*** Entry Width — ½ of width dim.

** "LW" Series Height from bottom of water leg to center line of horizontal outlet.

SPENCER
HEATER
A PRODUCT OF AVCO CORP.
WILLIAMSPORT · PENNSYLVANIA



"C" SERIES
For Oil, Gas or Hand Firing

A three-pass horizontal firetube boiler for medium sized installations requiring high efficiency and quality equipment. Available with various height bases to suit firing equipment. Also with tank or instantaneous coils in a wide range of capacities.

"CP" AND "CPG" SERIES
Oil and Gas Package Units

Complete with boiler, refractory slab base, gas or oil burner with controls and boiler trim. Incorporates suspension firing—eliminating combustion chamber. Easy and quick to install. Low waterline for problem installations. Jacket and coils are optional equipment.

"C" SERIES BOILER DIMENSIONS					S.B.I. RATINGS			"CP" AND "CPG" PACKAGE BOILER DIMENSIONS					
						Net Ratings				Dim. include Jacket			
Shell Width	Shell Length	* Height	* Water Line	Boiler Model	Gross Output MBH	Steam Sq. Ft.	St. & Wt. MBH	Gas-Boiler Model	Oil-Boiler Model	Width	Length	Height	Water Line
28⅜	39	65¼	57¾	C-130	468	1460	351	CPG-130	CP-130	29¾	41¼	54⅝	46¼
28⅜	44	65¼	57¾	C-150	540	1690	405	CPG-150	CP-150	29¾	46¼	54⅝	46¼
31⅜	43	68¼	60¾	C-180	648	2020	486	CPG-180	CP-180	32¾	45¼	57⅝	49¼
31⅜	52	68¼	60¾	C-220	792	2480	594	CPG-220	CP-220	32¾	54¼	57⅝	49¼
34⅜	52½	72¼	64½	C-260	936	2930	702	CPG-260	CP-260	35¾	54¾	61⅝	53
34⅜	61½	72¼	64½	C-300	1080	3380	810	CPG-300	CP-300	35¾	63¾	61⅝	53
41½	56	79	70½	C-350	1260	3940	945	CPG-350	CP-350	43	58¼	69	59½
41½	63¼	79	70½	C-400	1440	4500	1080	CPG-400	CP-400	43	65½	69	59½
41½	70½	79	70½	C-450	1620	5060	1215	CPG-450	CP-450	43	72¾	69	59½
41½	77¾	79	70½	C-500	1800	5620	1350	CPG-500	CP-500	43	80	69	59½

* Height and waterline Dim. includes Standard 15" Base.

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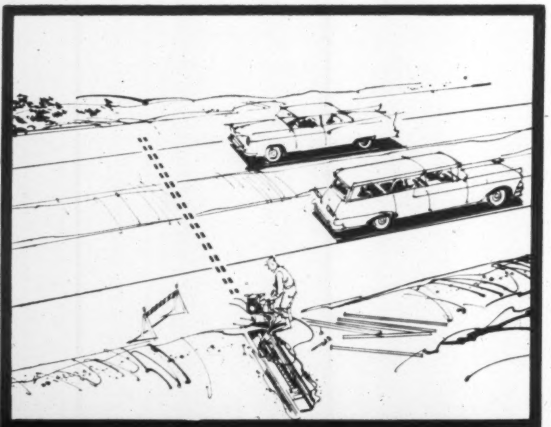
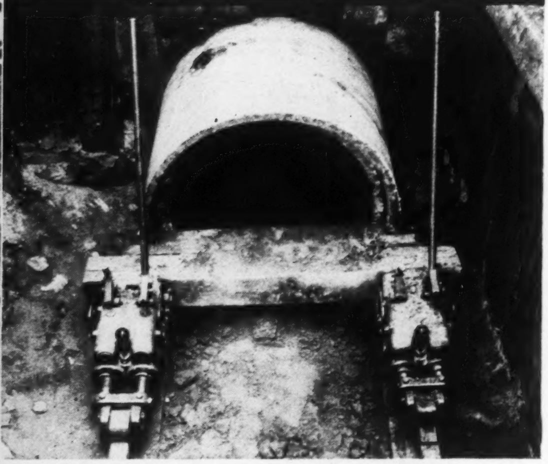
wherever pipe must go underground

Cut job time and costs to a fraction

with a Greenlee Pipe Pusher

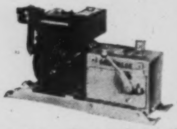
Here's the fast, easy way to install pipe and ducts under streets, walks, tracks, lawns, floors. Model No. 790 GREENLEE Hydraulic Pipe Pusher (left) with power pump pushes ¾″ - 4″ pipe about two feet per minute. A small ditch accommodates the pusher — streets and other property remain undisturbed. Costly tearing up, tunneling, filling, repaving are eliminated. The GREENLEE Pusher is a compact unit, simple to transport, set up, and operate. Hand or power-pump operated. Two models: No. 790 for ¾″ - 4″ pipe; No. 795 for pipe over 4″, concrete sewer and corrugated ducts. See your supplier or write for descriptive literature.





Two No. 795 Pushers in twin setup pushing large concrete sewer pipe under tracks.

OTHER GREENLEE TIME SAVING TOOLS TO SPEED YOUR JOBS, CUT COSTS



High-pressure Power Pump for operating GREENLEE Hydraulic Pipe Pushers, Pipe Benders, and other hydraulic rams and jacks.

Hydraulic Pipe and Conduit Benders for ½″ - 4″ sizes. Lightweight, portable, one-man-operated. Full 90° bend with one ram stroke!

TOOLS FOR CRAFTSMEN

GREENLEE

GREENLEE TOOL CO.

1780 Columbia Ave., Rockford, Illinois

wherever your jobs call for bent pipe or conduit

Make big savings on labor and materials

with a Greenlee Hydraulic Pipe Bender

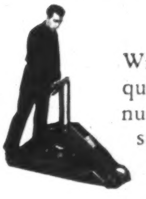
Bend pipe or conduit where and when needed with a compact, portable GREENLEE Lightweight Hydraulic Bender. Three models to select from to give you the exact equipment needed for your jobs.

No. 880-M2 (above) A small, portable unit that bends six sizes of pipe or conduit ½" - 2". Easily carried and operated by one man. Makes full 90° bend with one ram stroke. Operated with hand pump, as shown, or with portable power pump.

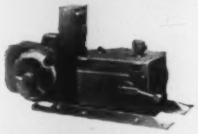
No. 883 (left) A medium-range, portable unit that bends eight sizes of pipe or conduit ½" - 3". Makes full 90° bend with one ram stroke. Operated with portable power pump, as shown, or hand pump. Takes but one minute to make a 90° bend in 3" pipe when operated with power pump.

No. 884 Similar in design to No. 883, but of larger size to bend 10 sizes of pipe or conduit ½" - 4". Regularly supplied with GREENLEE Power Pump illustrated at left. Takes only 4 minutes to make 90° bend in 4" pipe.

GREENLEE bender line also includes No. 785-BE . . . a large, heavy-duty power bender for pipe up to 6".



With a GREENLEE Lightweight Hydraulic Bender *one* man can quickly, easily make on-the-spot bends in conduit or steel, aluminum, and stainless pipe. A full 90° bend is made with *one* ram stroke, one setting. Compact, lightweight . . . easily carried or wheeled from job to job. Pipe or conduit easily inserted and removed from front of bender. "Quick-removal" positive-locking support pins. Hydraulic ram can be used with GREENLEE tubing, thin-wall conduit and bus-bar bending attachments. Complete range of sizes for pipe and conduit ½" through 4". See your supplier or write for literature.



OTHER GREENLEE TIMESAVING TOOLS TO SPEED YOUR JOBS, CUT COSTS

High-pressure power pumps for operating GREENLEE Hydraulic Benders and Pipe Pushers, and other hydraulic rams and jacks. Hydraulic Pipe Pushers for easy, fast installation of underground piping . . . eliminate tearing up streets, walks, lawns, floors.

GREENLEE TOOL CO.
1779 Columbia Ave., Rockford, Illinois

TOOLS FOR CRAFTSMEN
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Bituminous Coal.

BCI Fuel Engineering Data SECTION F-1

FUEL ENGINEERING HANDBOOK

CLEANING FIRE AND RESTORING FUEL BED ON UNDERFEED STOKERS

New College Heating Plant Switches to BCR Coal-Pak Units

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UNDERFEED STOKER FIRED LOW PRESSURE HEATING PLANTS

LOW PRESSURE HEATING PLANT

BCI News Notes BCI

BCI ADVISORY COMMITTEE MANUAL

RECOMMENDED BOILER ROOM PLANS FOR MODERN

OREGON
IDAHO
NEVADA
12

Shown are just some of the publications available from BCI. Data include diagrams and designs, case histories, current fuel developments, plant specifications, etc.

Bituminous Coal Institute provides a nationwide service for men who influence the selection of fuel and fuel-burning equipment for new or remodeled power plants. This service involves engineering design, fuel cost surveys, equipment costs and other pertinent information.

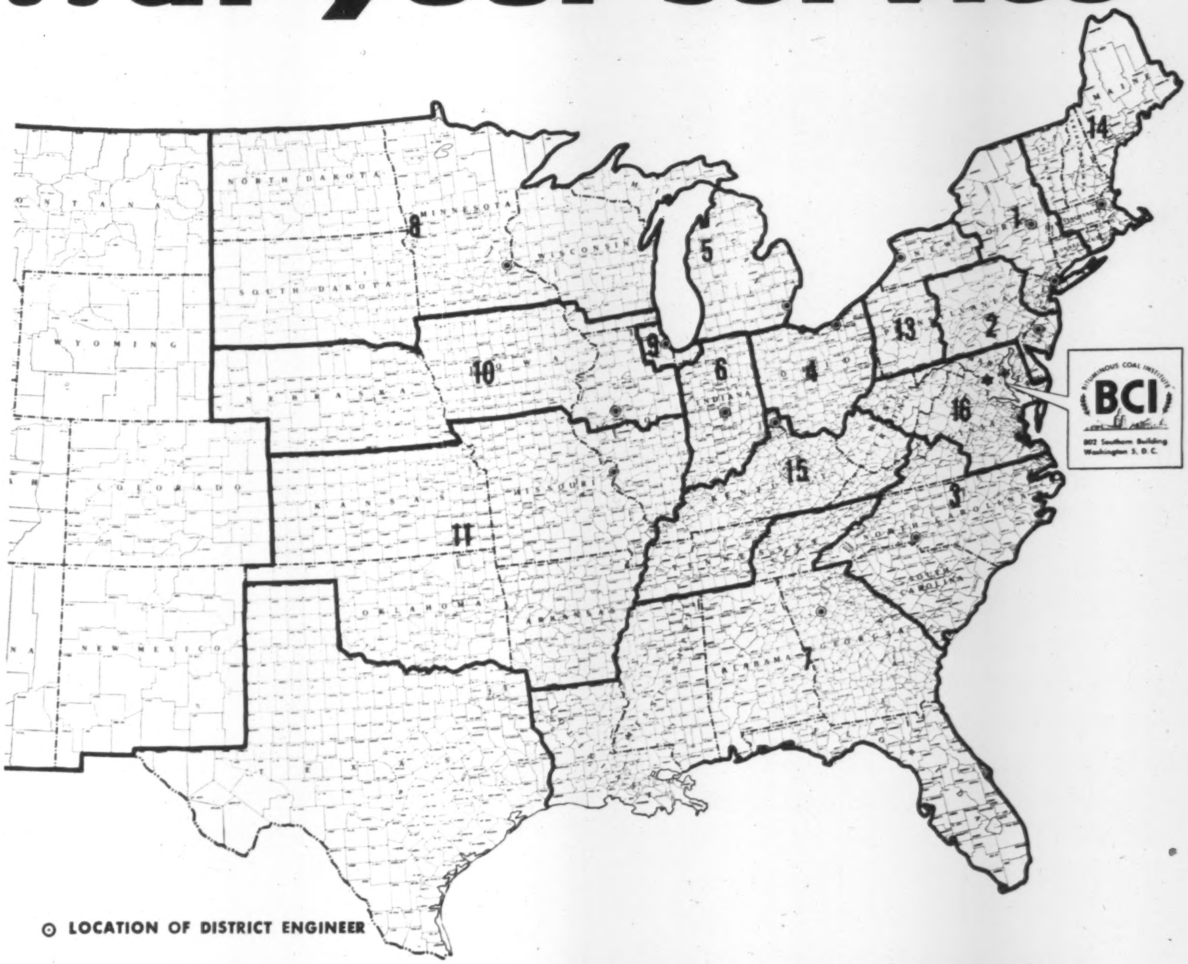
Competent representatives are strategically located throughout coal-burning states, as indicated on the map at right. These BCI men, thoroughly familiar with their districts, work from a strictly engineering viewpoint to assist in selecting the fuel best suited for individual installations on the basis of economy and efficiency.

If you can use any of the literature shown above—or require the personal services of our representatives—the Bituminous Coal Institute invites your inquiry.

Bituminous Coal Institute

Dept. HP-01, Southern Building, Washington 5, D. C.

..at your service



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Experiences with a Few Consultants Cloud Engineering Contractor's Views

IN HIS ARTICLE, *An Engineering Contractor's View of Consulting Engineers' Responsibilities and Fees* (November 1959), A. I. McFarlan must be basing some of his ideas on his experiences with a few consultants. His views are well taken, but I do not believe the reputable consultant is overly fee conscious or guilty of repetitive engineering. However, I do know we have many so-called consulting engineering firms that are guilty of these practices and should not be practicing.

I believe the majority of consultants are always looking for new ways and methods to reduce the cost of the mechanical installation—regardless of what effect this has on their fee. I do not agree that most clients appreciate changes at any time of a project unless, of course, the change is initiated by the client.

Getting an additional fee for changes to the plans or specifications to reduce the cost of the work should in most cases not be necessary if the proper investigations and studies were made in the first place. However, if the plans and specifications were prepared in accordance with a design criteria prepared by the client, which results in costs that exceed the budget, then the client should compensate the engineer or architect for the additional expenses. But this sometimes leads to arguments and the loss of clients.

JOHN F. LAWRENCE
Counts & Lawrence
Consulting Engineers

THE AUTHOR'S REPLY—Mr. Lawrence expresses a viewpoint I would have shared 10 years ago. But as an increasing amount of my company's efforts are devoted to improving air conditioning methods and trying to get consultants to use them, this viewpoint is changing. The experience has been with many consultants, and while there have been expressions of interest, there has been little or no action.

Mr. Lawrence states that "the majority of consultants are always looking for new ways and methods to reduce costs of the mechanical installation." I am inclined to believe this is true, provided such a change is limited to a substitution of one piece of equipment for another in a previously used method. However, we have found the real opportunities are in radical changes of method which require study and investigation. Almost universally, engineers say this is impossible due to increased engineering expense.

If direct analyses of relative efficiencies are submitted, they are rejected as criticism, particularly if a comparison is made with an engineer's design. Further consideration is frequently denied, even to the rejection of an alternate bid which may be lower in cost and at the same time produce material benefits. If only the possibilities of improvements are advanced, rejection is based on conservatism and the necessity of using only more widely accepted methods. If the design is installed and proven, then future consideration is rejected because of deviation from the traditional separation of engineering and contracting.

To date, purchasers have been the main source of acceptance of improved methods, and in most cases the engineers have never forgiven a direct approach to purchasers.

About four years ago, this was recognized as a real problem, in spite of the fact that we have consistently and continuously offered to share our experience with architects, engineers, and competitors charging only a nominal royalty. A proposed "open letter" was prepared, pointing out specific possibilities of changes. The letter also pointed out that "the control of new building, and in some cases old building air conditioning, rests jointly today in the hands of architects and consulting engineers." The letter was an appeal to use this given power to investigate the possibilities for the good of the industry and to the advancement of the profession. This was sent to a sample cross-section including architects, engineers, and others vitally concerned in the industry.

Unfortunately, instead of recognizing the appeal for mutual cooperation, this was construed by one well-known group of consultants as "implying that the codes of ethics of most engineering associations are being violated by their members."

These problems are not limited to my own personal contacts, but are general where new methods are offered, especially by the engineering-contractors who are attempting to develop much needed improvement in methods. The sad part of the situation is that, too frequently, all parties concerned hesitate to express their viewpoints openly in fear of the ostracism which often results. These are the stumbling blocks which must be removed before the air conditioning industry can make the rapid strides possible. I think we all agree no one engineer, contractor, nor company has a monopoly on brains. The sooner the engineers and contractors pool their talents, the sooner the new developments will become tradition. Patented improvements must be recognized and more fairly evaluated rather than being rejected solely because of the patent.

As to Mr. Lawrence's discussion of the fee structure, I would like to refer him to an article which appeared in the June 1958 issue of Architectural Forum titled *How Much Should Architects Be Paid?* This article forcefully brings out the fact that many important and well-known architects are aware of this problem, but again, inertia of present fee standards seems to stand in the way of a solution.

My reference to clients appreciating changes was intended to imply changes which materially reduce first cost and operating expense and solve problems. The time element was intended to mean changes even after drawings are completed, i.e., in the bidding stage *if* they accomplish real benefits. Such changes can possibly involve extra expense to the architect and engineer, and it is such expense which should be recognized and paid by the client in proportion to the benefits. Frequently, the engineer recognizes his cost, but does not ask for further remuneration and denies the benefits, usually falling back on "it's too late to change on this project, but we will look into it on the next one." The next time, the process is repeated. However, we have found many times where such late changes have been accepted that they have speeded completion. We have also found, in the detailed study involved in a change, that many times potential problems have been discovered and eliminated before the construction had gone too far. Here again, the mutual pooling of talent eliminated a molehill before it became a mountain.

All of this is said merely to present the facts as we have found them. We imply no criticism since we all have our particular problems to work out. This evidence is offered hopefully to try to correct a situation. It will help the architects and engineers as well as benefit their clients if the correction can be accomplished. With more than 10 years of increasingly intensified development work, we can assure you a pint-size discovery can open up a whole new ocean of progress. We highly recommend engineers getting their feet wet. The water may be cold and they may have to swallow some salt, but consultants will find the experience highly stimulating—and rewarding. We have found that the greater the beneficial deviations from many present methods, the greater the improvement for all concerned.

A. I. McFarlan
President
A. I. McFarlan Co., Inc.

Unified Efforts of Dedicated People Have Made U of C. System What It Is

The article, *Steam Metering, Billing Procedures Pay Off in U. of C. Heating Plant*, by Lyman R. Flook (December 1959), emphasizes the broad spectrum of engineering, human relations, finance, accounting, and psychology required in order to achieve in one central plant the built-in benefits of the original design.

It took "sound engineering" in the first place to make the interesting results described by Mr. Flook possible. But it also took persistent application and unremitting vigilance in the use of the several devices cited that were and are used in arriving at the results noted. First, the plant had to be designed by competent professionals. Then the blueprint had to be made corporate by the use of proper materials. The operating staff had to be assembled and coached. Measuring devices had to be installed to acquaint management of quality, quantity, and distribution of the products. An accounting system had to be devised to disclose the actual costs achieved in order to have an indisputable basis for customer billing. The accounting system is also used as a basis for the accumulation of funds for repair and necessary replacement due to wear and tear. A program had to be developed to help the customer get the greatest benefit for his steam expenditure by means of a cooperative inspection system and the subsequent analysis of the findings. Cooperating were operators, maintenance personnel, and faculty representatives. A continuous followup—check and double check—was necessary throughout the 30 years. This has been the background which has resulted in "A Testimonial for Sound Engineering," as outlined in the November article by Mr. Flook.

Mr. Flook disposes of the popular controversy regarding the economy of reducing building temperatures at night by stating, "the evidence can be found here" that large savings are effected by setting nighttime temperatures down and presumably restoring comfort conditions each day. I think he would be more convincing if actual figures were available to prove his contention. Preferably, comparable consumption data for the same building group reduced to a common denominator by means of his factor "X" for reasonable periods for both types of operation would be helpful.

It is seldom possible to have access to the detailed day to day and year to year operation of an institution for so long a period of time. It is still more unusual to have uninterrupted continuity of aggressive and sympathetic administrative policies carry over from one administration to another without the customary changes.

Lester S. Ries
Consulting Engineer

Contractor Reports on Fabrication Of Ductwork at Argonne Fuel Lab

I have read with no small amount of interest the article, *Select Stainless Steel Piping, Ducts for New Plutonium Fabrication Facility* (December 1959), about the piping and duct systems for the inert atmosphere at Argonne National Laboratory.

As contractors, our primary interest was the fabrication of the helium atmosphere ductwork and its accompanying leak-rate test problems.

It was apparent from the outset that, in the fabrication of the stainless steel ductwork, leak-tightness was of the utmost importance. The maximum diameter of a hole established by the allowable leak rate was in the order of 0.00000488 in.

As a first step, it was decided to shop leak test all welds and to fabricate assemblies as large as possible to reduce the amount of field welding to a minimum. A permanent test rig was set up, using a tank containing halogen to pressurize the assemblies and utilizing an eductor to evacuate the assemblies to the atmosphere after testing. Evacuation to the atmosphere was necessary to keep the test area free of contamination. Testing pressure in the assemblies was kept below 10 in. water gage.

The test procedure was as follows: Gasketed blockoffs for all openings were first greased to provide a tight seal. These blockoffs were checked first for leak tightness after the assembly was pressurized. The welds were then probed at the rate of about 1 fpm. Leaks were ground out and rewelded immediately and then rechecked.

The difficulties encountered in this method of testing were two-fold. First was the time-consuming operation of blocking the openings of the assemblies before pressurizing. Second was the presence of "drift" from a leak, making it difficult to pinpoint its location. In the latter case, a section of weld 5 to 6 in. long was ground out and rewelded. The blocking off operation was speeded up somewhat by the use of quick acting clamps with solid neoprene gaskets backed up by heavy plate.

One other major problem encountered in the fabrication was our inability to hold the finish and the flatness of the flanged connections after welding. Flanges were nonstandard, lightweight, Type 304 stainless steel that was faced to a 32 microfinish. This problem was solved by welding a 6 in. stub to the flange after which it was faced to the required microfinish. The succeeding welded connection was far enough from the flange face that welding did not disturb the finish or flatness.

As much of the shop welding as could be done was run on an automatic setup. The rest was welded manually. In all, one automatic setup and three hand machines were used.

At the site, after field welding had been completed, another complete probing of all weld areas was made with a mass spectrometer and a final leak-rate test was conducted on each system. Both of these tests were under the supervision of Argonne personnel.

C. R. Freeman
President
Bloomer Heating & Ventilating Co.
Contractors and Fabricators

Shipboard Air Conditioning Article Might Create False Impression

Lewis Smith's *Shipboard Air Conditioning Design Is Based on Unusual Considerations* (October 1959) creates an impression that there are primarily two types of air conditioning systems commonly used for marine air conditioning, these being the terminal reheat and dual duct systems, respectively. We believe this to be a distortion of the facts as it ignores the relatively wide application of high pressure induction systems which have been and are currently being used on many important vessels, including the nuclear merchant ship Savannah, the S.S. Matsonia, and the Lykes cargo vessels. Statistically, there are many more systems of this type in operation on shipboard than dual duct systems.

High air velocities up to 6000 fpm, as mentioned in the article, are by no means a proprietary feature of the dual duct system, which is the impression created by the text. Many manufacturers of air conditioning equipment have available terminal reheat outlets, induction type outlets, dual conduit system outlets, as well as dual duct outlets, all of which can be applied with the high air duct velocity mentioned. Actually, a maximum velocity of about 5000 fpm is recommended, as above this level noise regeneration in air ducts becomes a problem and excessive fan horsepower as a result of high pressure loss makes the system uneconomical.

William Masin
Manager
Military Engineering Dept.
Machinery and Systems Div.
Carrier Corp.

The author's reply—I am glad to note Mr. Masin's comments. I always wonder how such articles impress the reader. I'm sorry he thinks that this article creates an impression that there are primarily two types of air conditioning systems commonly used for marine air conditioning. Certainly, this was not my intention. No doubt he gets this impression because I devote much more space to those two systems than to the high pressure induction system in which he is interested.

Let me explain how this comes about. I did not see as much newsworthy information in the application of this familiar land system to shipboard, other than the higher air velocities used, which I mentioned. I did say that "this system has now become popular on shipboard," and thought that anything more would be redundant.

Lewis Smith
Heating Engineer

Obtaining Oil Return is No Problem If Suction Lines Are Properly Sized

I appreciate C. T. Baker's kind remarks ("Open for Discussion," November 1959) about my article, *Pressure Losses in Refrigerant Piping; What You Can Do About Them* (October). The field experience which he has had supports his opinions.

We have found that, if the suction lines from direct expansion evaporators are sized to give friction loss gradients as indicated in my article, there will be no difficulty in obtaining oil return so long as there are no trapped sections where velocity is not maintained. Indeed, some recent investigations on the west coast have revealed that even where there are traps in oil return lines the action is merely to fill up the trap to the point where the remaining area for flow increases the velocity to such an extent that it will again pick up the oil and carry it back in entrainment to the evaporator.

If the evaporator is of the flooded type, oil will collect in the evaporator and must be re-introduced in the relatively high velocity suction line by some means such as an oil recovery device. After reintroduction to the suction line, the friction gradient should be maintained as high as indicated in order to assure return.

We are always going to experience pressure drop in the suction mains. If the lines are long, this pressure drop can become significant if sufficient friction gradient is to be maintained for oil return. In these cases, one must decide whether to keep the high pressure drop and allow for the increases in suction specific volumes when sizing the compressor or to use larger lines, forego the ability to return oil, and collect it at some point where it can be returned to the compressor by some such device as a pressurized return system on a receiver.

W. C. Smith
Product Engineer
Air Conditioning & Refrigeration Div.
Worthington Corp.

No Best Way to Alleviate Problem When Matrix Ill-Conditioning Occurs

The authors of the article, *Computer Program KO's Piping Stress Problems* (December 1959), should be congratulated for their fine job. I have no arguments with the manner in which they make the calculations for this important analysis, but I would like to convey some of our own experiences.

Matrix inversion becomes an extremely difficult problem when ill-conditioning occurs. I am not sure there is any best way yet devised to alleviate the trouble in such cases. Unfortunately, my experience with the matrices obtained in these analyses shows that occasionally they can be very ill-conditioned. Therefore some protection should be included in the calculations so that users will know when results are questionable.

I believe the reason these particular matrices become ill-conditioned results from certain simplifying assumptions usually made in the general analysis. Sir Richard Southwell so indicates.

The examples given consider pipe with large diameters and thin walls. Such a condition should be approached with caution inasmuch as relatively thin bends or elbows under internal pressure act like Bourdon tubes. Thus, internal pressure will drastically affect flexibility and stress intensification factors.

I recommend J. E. Brock's excellent method to anyone working on this type of problem (ASME Journal of Applied Mechanics, December 1952, p. 501, and September 1955, p. 361). I have used a number of Dr. Brock's proposals in the successful construction of two such programs for use on a large computer.

J. A. Prest
Staff Engineer
Standard Oil Co. (Indiana)

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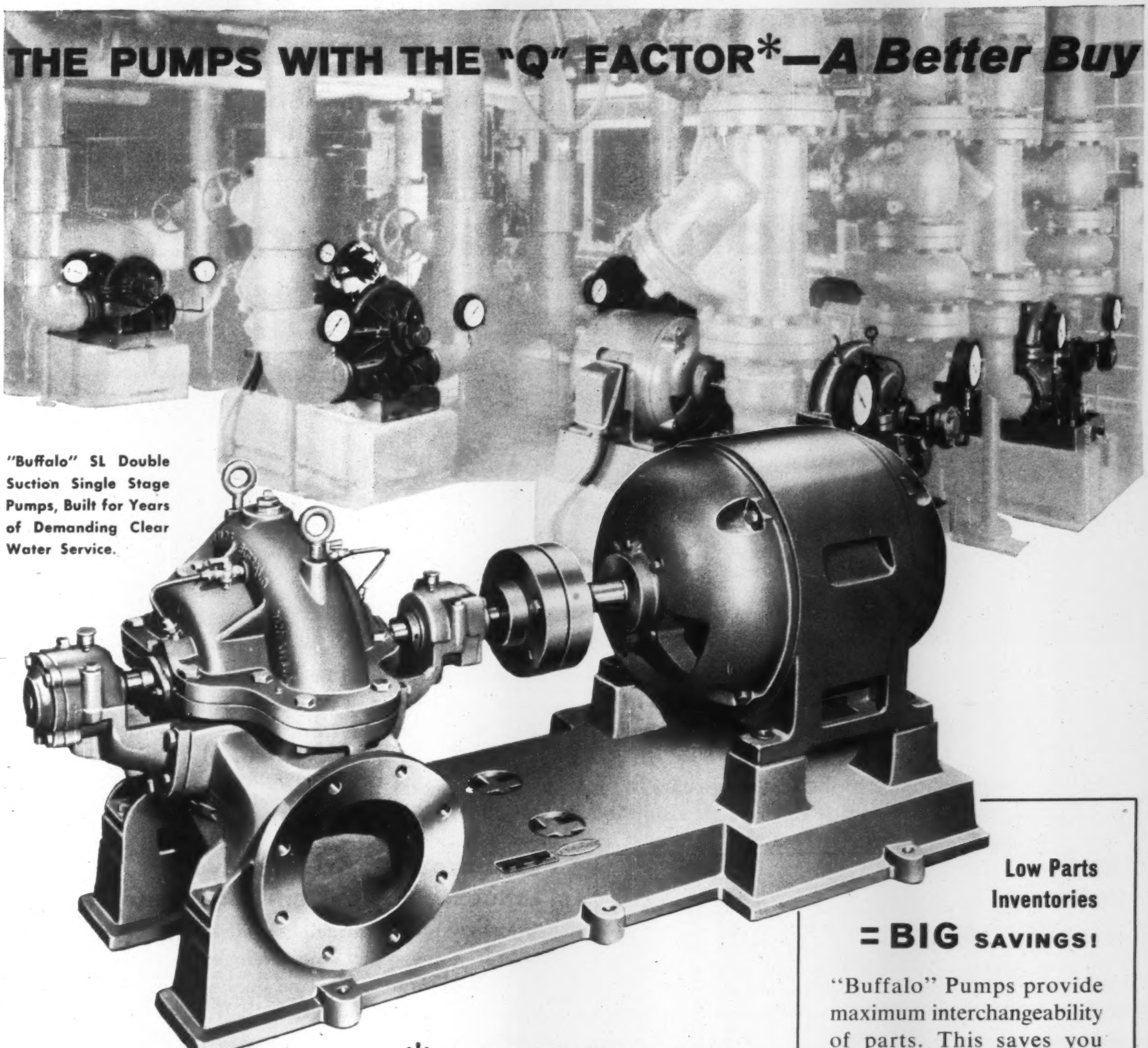

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question of the month

"How Should Steam Valves Be Sized?"

This question was asked previously in Heating, Piping & Air Conditioning and is repeated here, along with an answer that has been received from a reader. Other solutions or comments for publication are invited.

> *"A commonly used rule of thumb for sizing low pressure — under 15 psig — modulating steam valves, is to use a pressure drop through the valve of from 40 to 60 percent of the line pressure just ahead of the valve.*
>
> *"For higher pressures than 15 psig, the rule says the drop should be 25 to 35 percent of line pressure. This second rule has been questioned, with the statement that modulating valves on higher pressures, say from 20 to 100 psig, should be sized for a greater pressure drop than valves on low pressure lines.*
>
> *"The rule further says that positive acting — two-position — steam valves should be sized for pressure drops 25 to 50 percent lower than those which have been given.*
>
> *"Another rule of thumb for modulating water valves, including three-way mixing valves, says that these valves should be sized for a drop of from 5 to 15 percent of the line pressure ahead of the valve. This applies when the valve is on the inlet side of a heating or cooling coil. When the valve is on the outlet side, the pressure drop may be increased by 25 to 50 percent.*
>
> *"There is much variation of opinion on this subject, and I would like to hear what other engineers have to say about this. I believe that Heating, Piping & Air Conditioning can clarify the situation by publishing these comments."—F.A.R.*

Pressure Drop Across Valve Is Influenced by System Requirements

A REVIEW of flow principles indicates that allowable pressure drop across a modulating valve is influenced by system requirements and does not necessarily depend upon upstream pressure only. Usually, allowed loss is dictated by process needs with upstream and downstream pressures and line losses established.

When pressure drop is provided in a system to satisfy control needs, selection of an exact value is arbitrary. A commonly employed rule allows approximately 50 percent of system friction loss exclusive of the valve, or about one-third of total pressure loss including the valve. For most applications, it is recommended not to have less than 5 to 10 psi pressure drop. To avoid limited controllability, it is well not to have increased friction loss in the piping system resulting from greater flow rates and/or reduction of flow area caused by fouling of the piping.

With control valve cost a function of size, some engineers select a unit having limited capacity. Clarification between design and maximum flow rates needs to be made to prevent this condition. To protect against this possibility, an allowance of 25 to 60 percent of design flow rate should be added. This will better assure that the valve will operate within the required limits of control. The excess also compen-

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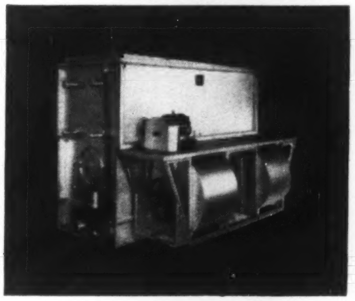

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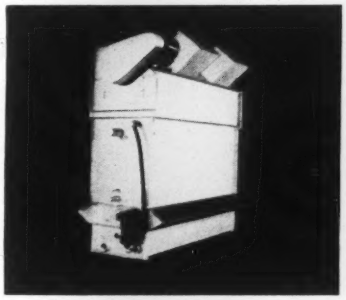

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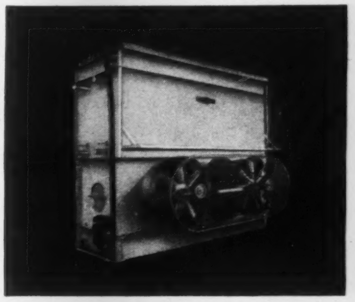

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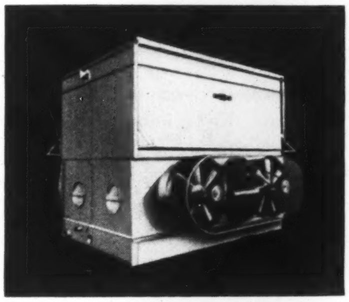

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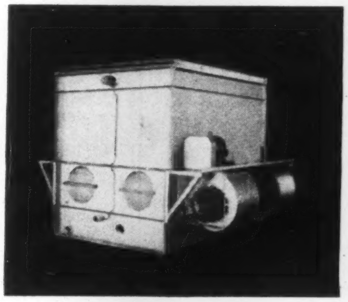

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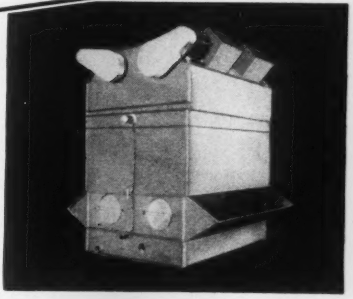

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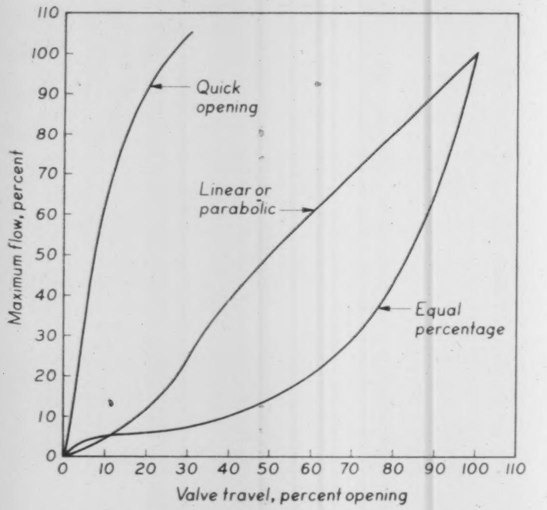

1 WHERE PRESSURE DROP of piping exceeds that of control valve, equal percentage type of plug is recommended. When system pressure loss remains nearly constant during varying flow rate, linear or parabolic plug design is best suited. For *on-off* control, where throttling is not involved, quick acting plug should be employed. This design provides full opening with short stem travel and can also be used for linear flow conditions having constant pressure

sates for possible increased flow rates due to future process changes.

A review of valve design characteristics is necessary if process flow rates vary between wide limits which would require the valve to operate between nearly closed to wide open positions. Steam valve sizing should be influenced not only by maximum flow rate and accompanying minimum pressure drop, but also by minimum flow rate and maximum pressure loss.

Relation of flow rate, pressure drop and valve size for water and steam services are given by the following:

For water:

$$C_v = Q\sqrt{G}/\sqrt{P_1 - P_2}$$

For saturated steam with pressure drop across the valve less than one-half absolute inlet pressure:

$$C_v = (W/3)\sqrt{(p_1 - p_2)\,p_2}$$

For superheated steam with pressure drop across the valve less than one-half absolute inlet pressure:

$$C_v = (WK/3)\sqrt{(p_1 - p_2)\,p_2}$$

For saturated steam with pressure drop across the valve equal to or greater than one-half absolute inlet pressure:

$$C_v = W/1.5\,p_1$$

For superheated steam with pressure drop across the valve equal to or greater than one-half absolute inlet pressure:

$$C_v = WK/1.5\,p_1$$

where

C_v = valve flow coefficient
Q = water flow rate, gpm
G = specific gravity of water
P_1 = water valve inlet pressure, psi
P_2 = water valve outlet pressure, psi
W = steam flow rate, lb per hr
p_1 = steam valve inlet pressure, psia
p_2 = steam valve outlet pressure, psia
$K = 1 + (0.0007 \times \text{F superheat})$.

Flow coefficient C_v is water flow rate passing through a fully opened valve at 60 F with 1 psi pressure drop. For example: a coefficient of 40 indicates 40 gpm will pass through an open valve at a drop of 1 psi. From this, it can be seen that valve size varies with the flow coefficient. The above formulas indicate that a small valve having a high pressure drop can be used if process conditions permit. The following table shows these relations.

C_v	Diam., in.	C_v	Diam., in.
1.0	3/16	40.0	2
1.6	¼	63.0	2½
2.5	⅜	100.0	3
4.0	½	160.0	4
6.3	¾	360.0	6
10.0	1	640.0	8
16.0	1¼	1000.0	10
25.0	1½	1440.0	12

If a control valve is oversized, it will stroke only a short part of its available travel. Fig. 1 indicates the relation of flow rate as a function of stem position for different types of valve plugs.

H. B. WAYNE
Consulting Engineer

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• *YOU ARE INVITED to contribute a question for publication or an answer to a published question. Write: The Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.*

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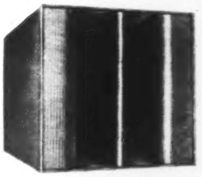

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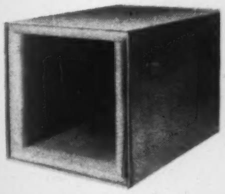

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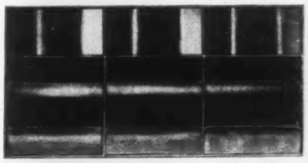

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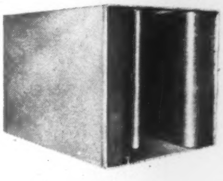

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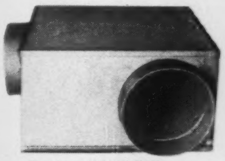

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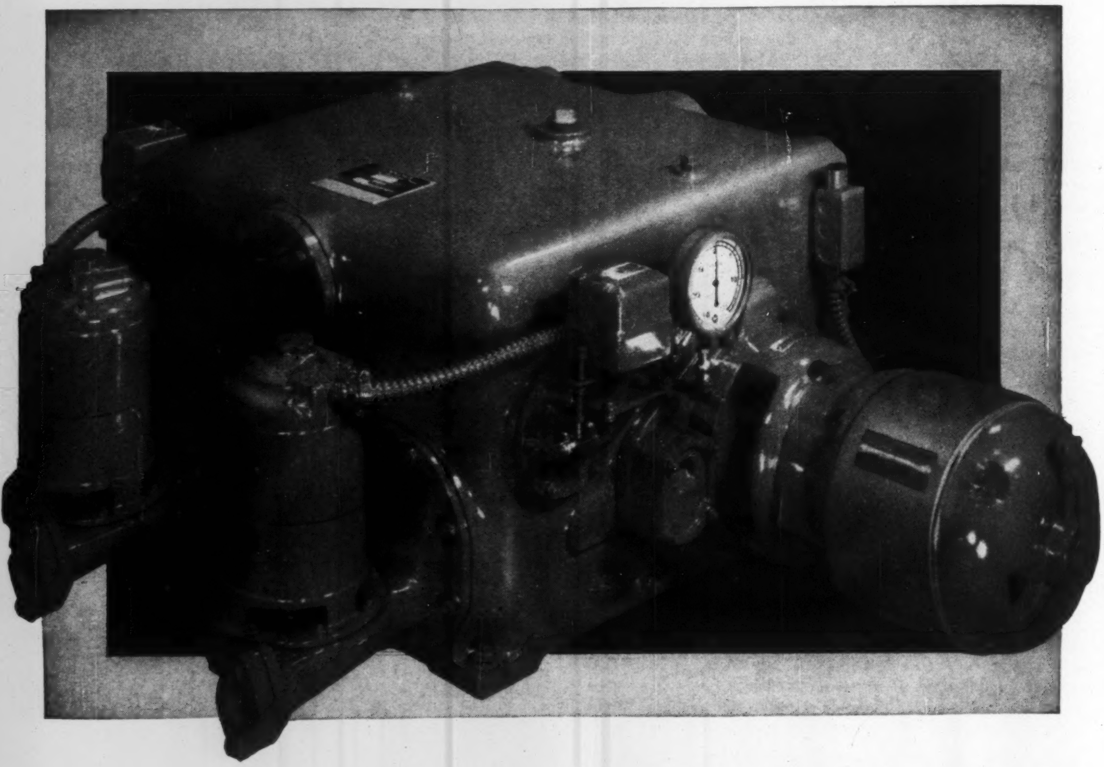

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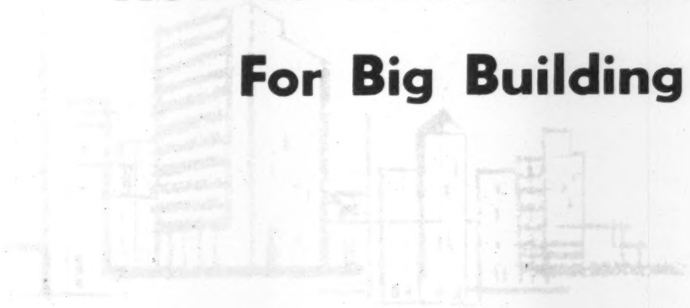
How to Estimate Energy Requirements For Big Building Air Conditioning



• An accurate determination of the energy requirements of the refrigerating equipment in a large central air conditioning system is essential for an economic analysis of alternative methods of producing the system's refrigeration requirements. For this reason, there is presented in the following pages a guide to estimating these needs. Accuracy of the method is proved by the metered results of the operating characteristics of such equipment in four types of buildings during the 1957 air conditioning season.

Too often, however, in analyzing the costs for these systems, fuel and energy costs are often given undue weight. Not enough consideration is given to overall operating economics. The equipment, therefore, should be regarded as a long term investment. In addition to fuel and energy costs, adequate evaluation should be given to boiler operation, condensing water, maintenance, and fixed charges on the investment.

ENERGY REQUIREMENTS of refrigerating equipment in large central air conditioning systems—generally, those rated 100 tons and up—can be estimated with reasonable accuracy by using the results of studies conducted by the research committee of the Commonwealth Edison Co., Chicago. The studies are based on the recorded operating data of refrigerating equipment in four different types of buildings in the Chicago area during April through October 1957. According to U. S. Weather Bureau records, approximately normal temperature conditions prevailed in the area throughout this period.

Any analysis of the energy requirements of refrigerating equipment in a large central air conditioning system should include both the refrigerating unit and its auxiliaries. The factors underlying the operation of the unit differ somewhat from the factors governing the operation of the auxiliaries. Therefore, separate approaches must be made in estimating the energy requirements of the two sets of equipment.

The recommended method for estimating the energy needs of the refrigerating unit is based upon the fact that the unit will operate at varying load levels for various periods of time throughout the established air conditioning season. The committee's study shows that these varying load conditions affect the energy requirements of the unit. It also provides information for establishing the number of hours in the air conditioning season that the unit will be operated at various load levels.

The energy requirements of each type of refrigerating unit under consideration (electric, steam, or gas) can be estimated by finding, in a given case, the sum of the products of (1) the energy input at each load level (one-fourth, one-half, three-fourths, and full) of the refrigerating unit, and (2) the number of hours during which each load level will be operated throughout the established air conditioning season.

Four steps are involved in formulating the estimated energy requirements:

1) The first step is to determine the energy input values (kilowatts, pounds of steam, or therms of gas) for each load level (one-fourth, one-half, three-fourths, and full) of the types of refrigerating units under consideration. These values, obtainable from the equipment manufacturers, must be related to the sizes of the refrigerating units and their prime movers

TABLE 1 — AVERAGE HOURLY TEMPERATURE occurrences bearing on air conditioning refrigeration operation from March through November in the Chicago area are listed below. Totals are based on U.S. Weather Bureau records for 1951 through 1956

Temperature occurrences	Monthly average hours									Yearly average hours
	March	April	May	June	July	August	September	October	November	
55 F and above	40	237	480	675	743	741	625	372	100	4013
60 F and above	14	167	365	624	733	714	520	260	53	3449
65 F and above	*	103	268	548	680	652	379	173	21	2824
70 F and above	*	62	171	432	558	500	248	92	*	2063

*Less than 10.

TABLE 2 — TOTAL AIR CONDITIONING HOURS at each temperature level for various types of buildings are as follows

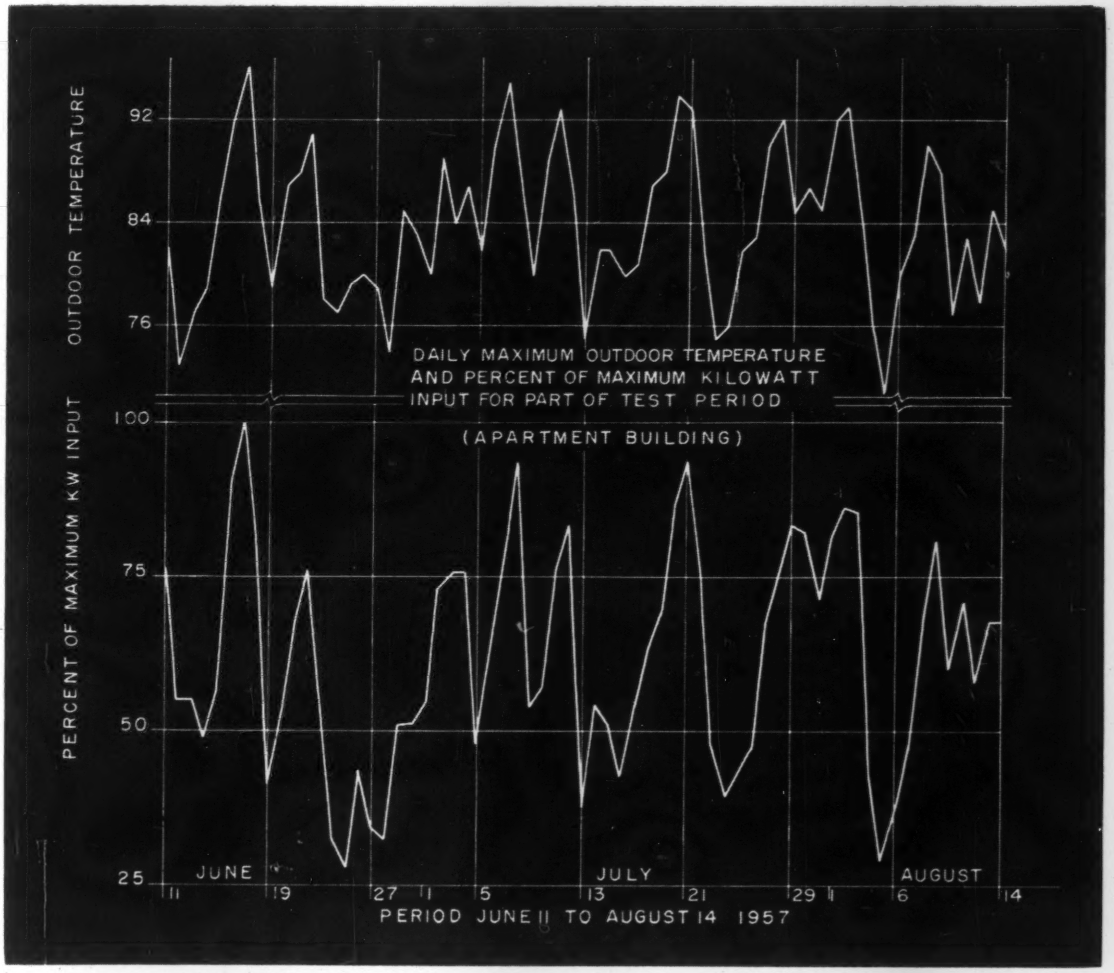
Type of building	Operating schedule	Temperature at which air conditioning is required	Total operating hours
Apartment building	7 days per week, 24 hours per day	55 F and above	4013
Hospital		60 F and above	3449
Hotel		65 F and above	2824
		70 F and above	2063
Commercial office building	5½ days per week, 12 hours per day	55 F and above	1577
Industrial office building		60 F and above	1355
Department store	6 days per week, 12 hours per day	55 F and above	1720
		60 F and above	1478
College building	7 days per week, 13 hours per day	60 F and above	1868
Library		65 F and above	1530
		70 F and above	1117

TABLE 3 — AIR CONDITIONING OPERATING HOURS assignable to each load level for various types of buildings are listed hereon. Totals are based on metered studies

Type of building	Temperature at which air conditioning is required	Operating hours			
		¼ load	½ load	¾ load	Full load
Apartment building	55 F and above	710	1713	1409	181
Hospital	60 F and above	610	1472	1212	155
Hotel	65 F and above	499	1205	992	128
	70 F and above	365	881	724	93
Commercial office building	55 F and above	418	684	404	71
Industrial office building	60 F and above	359	588	347	61
Department store	55 F and above	26	901	655	138
	60 F and above	22	775	563	118
College building	60 F and above	495	811	478	84
Library	65 F and above	405	664	392	69
	70 F and above	296	485	286	50

TABLE 4 — BASES FOR ESTIMATING monthly demand effects of electrically driven refrigerating units are given below

Type of building	Temperature at which air conditioning is required	Maximum demand, percent								
		Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
Apartment building	55 F and above	50	50	75	100	100	100	75	50	50
Hospital	60 F and above	50	50	75	100	100	100	75	50	50
Hotel	65 F and above	..	50	75	100	100	100	75	50	50
	70 F and above	..	50	75	100	100	100	75	50	..
Commercial office building	55 F and above	50	50	75	100	100	100	75	50	50
Industrial office building	60 F and above	..	50	75	100	100	100	75	50	50
Department store	55 F and above	50	50	75	100	100	100	75	50	50
	60 F and above	..	50	75	100	100	100	75	50	50
College building	60 F and above	..	50	75	100	100	100	75	50	50
Library	65 F and above	..	50	75	100	100	100	75	50	50
	70 F and above	..	50	75	100	100	100	75	50	..



1 **MAXIMUM DAILY TEMPERATURES** and percentages of seasonal maximum kilowatt input to refrigerating unit motors of apartment building studied are indicated above. Chart illustrates that there is definite correlation between maximum daily outdoor temperatures and requirements for air conditioning

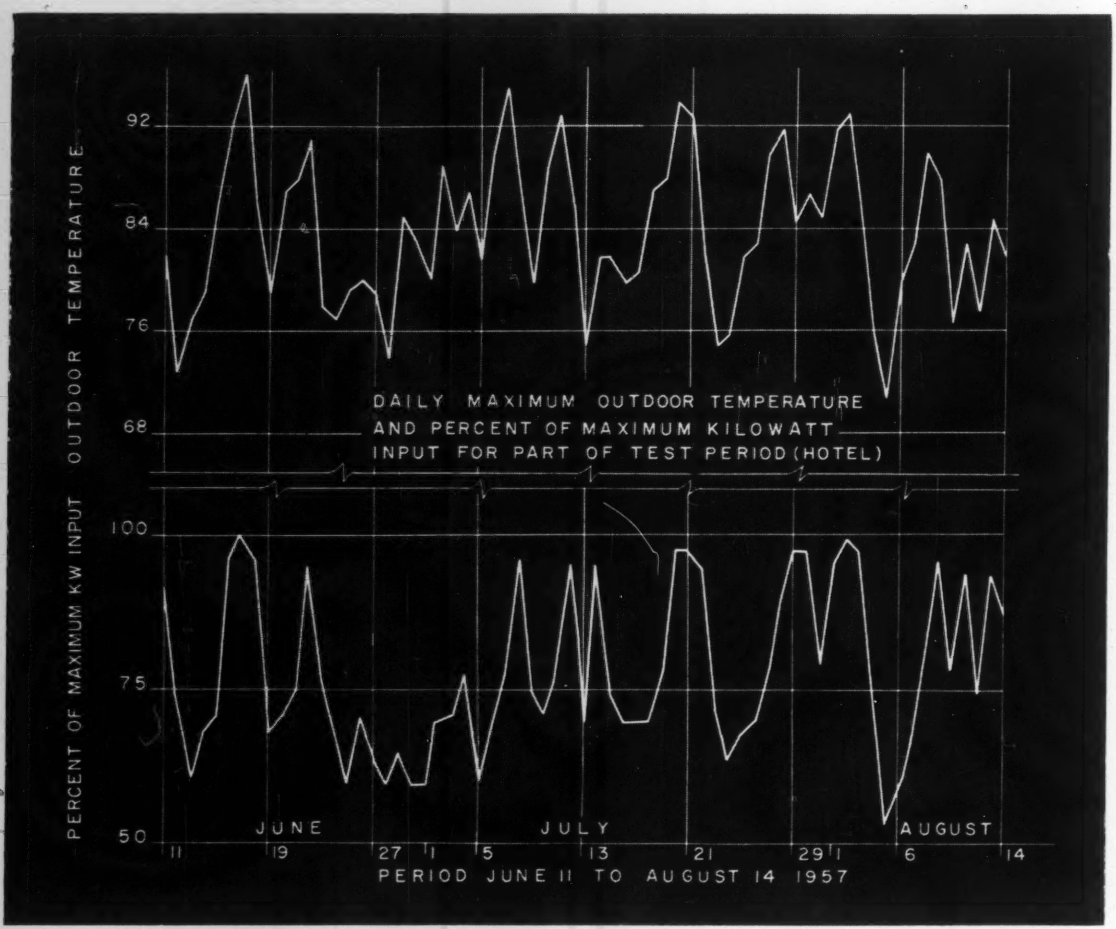
which are appropriate to the refrigeration tonnage requirements in the given case. The sizes of the types of units under consideration may vary somewhat, since manufacturers' standard sizes tend to be different for the different types of equipment.

2) The second step is to establish the air conditioning season for the given case. This means establishing the total number of hours during which the refrigerating equipment will be operated.

This involves, first, determining the number of hours per day and days per week when cooling will be provided. The use and occupancy of the premises in the given case will determine this. For example, a hospital will require cooling 24 hr per day for seven days a week. An office building will usually require cooling for 12 hr per day, five and one-half days per week.

The next factor bearing upon the total operating hours of the equipment is the outdoor temperature. Temperature levels to be considered are (a) 55 F and up, (b) 60 F and up, (c) 65 F and up, and (d) 70 F and up. Table 1 shows the number of hourly temperature occurrences at each of these temperature levels for each month in the year (average 1951-1956). It also shows the total operating hours for each temperature level which would result from providing cooling 24 hr per day, seven days per week. Table 2 shows the resultant total operating hours at each temperature level for various types of buildings, taking into account the varying hours per day and days per week for the cooling requirements of each type of building.

3) The third step is to break down the total operating hours established in Step 2 into the hours for each load level. Here, the results of the research committee's studies are invaluable. Based upon these re-



2 **PERCENTAGES OF TOTAL** building kilowatt input to refrigerating unit motors of hotel studied are compared with maximum daily outdoor temperature for part of test period. Air conditioning system operates around the clock, seven days a week

sults, Table 3 gives the operating hours for each load level for the various buildings shown in Table 2 and for various outdoor temperature levels.

4) The final step is to obtain the sum of the products of the results of Steps 1, 2, and 3.

Must Determine Needs of Auxiliaries, Also

Auxiliaries of the compressor type refrigerating unit (electric, steam, or gas) usually consist of a cooling tower fan or fans, and a condensing water pump. Those of the steam absorption type of unit usually comprise a cooling fan or fans, a condensing water pump, a solution pump, an evaporator pump, and a purge pump. In all cases, it is to be expected that the auxiliaries will be motor operated.

The steps involved in determining the estimated energy requirements of the auxiliaries are as follows:

1) The first is to determine the motor sizes of each of the auxiliaries related to the types of refrigerating units under consideration. This information can be obtained from the manufacturers of the refrigerating equipment.

2) The second is to derive the energy input values (kilowatts) for each of the auxiliaries. This can be calculated by converting the rated horsepower capacity of each of the motors in accordance with the following formula:

$$Kw = [0.746\ (hp) \times (0.75)]/0.75$$

where:

0.746 = kilowatt per horsepower
hp = rated horsepower of motor
(0.75) = ¾ loading of motor
0.75 = motor efficiency

3) The third step is to establish the total operating hours in the air conditioning season of the given case. This should be the same number of hours as have been established in the given case for the operation of the refrigerating unit.

4) The final step is to obtain the product of the

results of Steps 2 and 3.

In addition to the energy requirements of the refrigerating equipment (both the unit and its auxiliaries), determinations must be made of the effect of the electric power input to the equipment on the building's demand for electric service. In the case of an electrically driven refrigerating unit, this involves not only the auxiliaries but the refrigerating unit itself. In the cases of steam and gas refrigerating units, this involves only the auxiliaries themselves. These determinations are necessary in order to establish the total cost of the electricity required for each type of refrigerating equipment that is under consideration.

In determining the demand effect of the electrically driven refrigerating unit alone, the power input at full load can be taken to be the maximum demand of the unit. However, as found by the research committee's studies, the maximum demand of the unit will normally only be experienced during the months of June, July, and August. Table 4, developed from the results of the studies, shows the percentages of the refrigerating unit's maximum demand which can be expected to contribute to the demands for electric service for the various types of buildings at the various outdoor temperature levels governing the operation of the equipment.

The demand effects of the auxiliaries of each of the types of refrigerating units under consideration can be determined by (1) taking the kilowatt inputs under full load conditions as the maximum demand of the equipment, and (2) assigning such maximum demands to each month that the refrigerating unit is operating.

How Studies Were Carried Out

The studies were undertaken for the purpose of determining whether the seasonal energy requirements of the refrigerating units were affected by the load levels at which the units were operated. This

TABLE 5 — APARTMENT BUILDING air conditioning system data

Building data	
Floors	26
First (machine room and garage)	
Second (garage)	
Third (storage)	
Fourth to 25th (88 apartments)	
26th (heating plant)	
Floor area (apartments), sq ft	98,700
Building volume (living space), cu ft	807,000
Refrigerating system	
Hermetic centrifugal compressor, tons	170
Compressor prime mover, electric motor, hp	150
Chilled water pumps, hp	2-20
Air distribution system	
Fan coil units	

TABLE 6 — HOTEL system data

Building data	
Guest rooms (nine floors)	221
Total floor area, sq ft	76,950
Building volume, cu ft	705,000
Refrigerating system	
Compressor, 12 cycle, reciprocating, tons	100
Compressor prime mover, electric motor, hp	100
Evaporative condenser pump, hp	¾
Evaporative condenser fan, hp	10
Chilled water pump, hp	15

TABLE 7 — OFFICE BUILDING system data

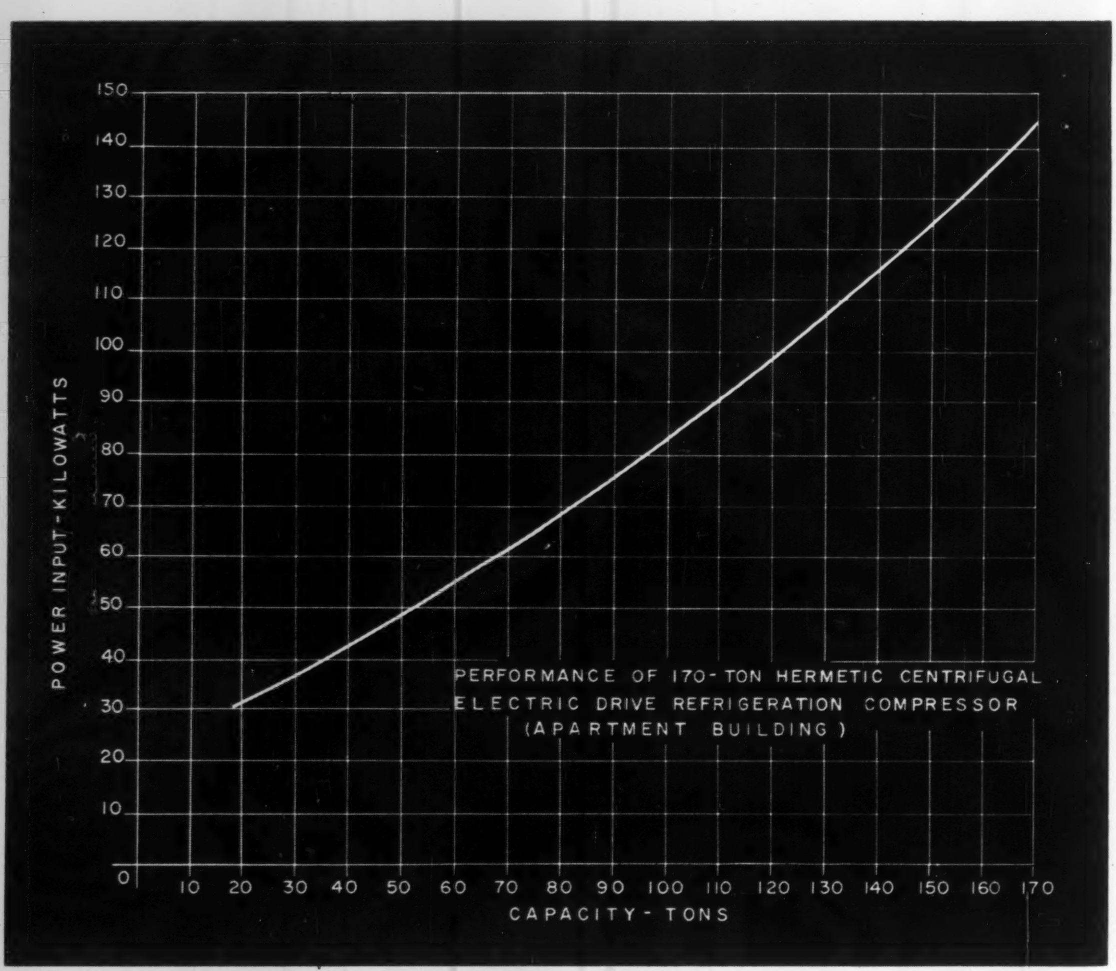
Building data	
Floors	22
Floor area, gross sq ft	667,000
Refrigerating system	
Compressors, centrifugal, tons	
Unit 1	350
Unit 2	450
Unit 3	600
Compressor prime mover, steam turbine, hp	
Unit 1	350
Unit 2	450
Unit 3	600
Condenser water pumps, hp	3-100
Chilled water pumps, hp	3- 75
Cooling tower fans, hp	2- 50
Makeup water pumps, hp	2- 3
Miscellaneous auxiliaries, total, hp	21.75
Air distribution system	
Fan rooms, total hp	429
Package 10 ton unit, hp	12

TABLE 8 — DEPARTMENT STORE system data

Building data	
Floors (including basement)	4
Total floor area, sq ft	160,000
Building volume, cu ft	1,920,000
Lighting, watts per sq ft	6
Refrigerating system	
Compressor, centrifugal, tons	500
Compressor prime mover, electric motor, wound rotor, hp	500
Condenser water pump, hp	40
Cooling tower fan (two-speed), hp	20
Chilled water pump, hp	25
Air distribution system	
Fan rooms- hp	4-40

TABLE 9 — OPERATING DATA for refrigerating units in air conditioning systems studied is listed below

	Apartment building	Hotel	Office building	Department store
Tonnage installed	170	100	1,400	500
Maximum tons used	126.5	69	1,000	416
Hours of operation	2,446	2,592	1,420	981
Ton-hours	136,680	100,000	717,520	272,039
Refrigerating unit				
Motor or turbine, hp	150	100	1,400	500
Maximum demand, kw	105.6	81.6	—	373.5
Seasonal energy use, kwhr	126,240	120,960	—	196,763
Seasonal energy use, lb of steam	—	—	9,981,500	—
Refrigerating auxiliaries				
Condenser water pump	—	—	300	40
Motor, hp	—	—	170	33
Energy use, kwhr	—	—	139,760	30,700
Cooling tower or evaporative condenser				
Motor, hp	—	10.75	106	20
Maximum demand, kw	—	7.9	89	19
Energy use, kwhr	—	18,596	24,480	18,900
Chilled water pump				
Motor, hp	40	15	225	25
Maximum demand, kw	15.2	15.5	185	13
Energy use, kwhr	37,279	38,241	190,960	10,900
Total				
Motor, hp	40	25.75	631	85
Maximum demand, kw	15.2	23.4	435	65
Energy use, kwhr	37,279	56,837	355,200	60,500



3 **OPERATING DATA** of hermetic centrifugal compressor shows that electric input to motor is reduced in same ratio as cooling load is reduced. Plotted above is performance of 170 ton electric motor driven unit serving apartment building

thesis for the studies was developed from observations of the operations of the multiple refrigerating units in the 72 West Adams Bldg. in Chicago. Records of the operations of the three refrigerating units in this case showed that only for short periods of time, during the hottest weather, were all three units required to be operated together. At all other times of the season, only one or two units were required.

The types of buildings covered by the studies were an 88-unit apartment building on Chicago's near north side, one of the city's major hotels, a 22-story downtown office building, and a department store located in a suburban shopping center.

The refrigerating units in three of the buildings were electric motor driven compressors. The fourth installation consisted of a steam turbine driven compressor. Electric drive installations included compressors of the reciprocating, conventional centrifugal, and hermetic centrifugal types.

In order to obtain the desired information, metering was installed in the following cases:

Building	Prime mover	Type of compressor	Tons
Apartment building	Electric motor	Hermetic-centrifugal	170
Hotel	Electric motor	Reciprocating	100
Office building	Steam turbine	Centrifugal	1400
Department store	Electric motor	Centrifugal	500

The studies were conducted during the following months of the 1957 air conditioning period:

Building	Period
Apartment building	June through September
Hotel	April through September
Office building	April through October
Department store	April through October

The types of metering installed were:

Prime mover			
Electric	Steam turbine	Auxiliaries	Chilled water circuit
Watthour Demand	Steam flow	Watthour	Hagan ton-hour

TABLE 10 — OPERATING CHARACTERISTICS of refrigerating units in air conditioning systems studied are presented

	Compressor, tons			Compressor motor		
Building	Rated capacity	Maximum registered	Percent of rating	Nominal rating, hp	Demand, kw	Percent of rating
Apartment building	170	126.5	74.5	150	105.6	87.6
Hotel	100	69	69.0	100	81.6	101.6
Office building	1400	1000	71.5	—	—	—
Department store	500	416	83.2	500	373.5	93.0
Average			74.5			94.1

TABLE 11 — HOURS OF OPERATION of air conditioning systems studied are as follows

	¼ load		½ load		¾ load		Full load		Total	
Building	Hours	Percent of total	Hours	Percent of Total	Hours	Percent of Total	Hours	Percent of Total	Hours	Percent
			(Based on rated capacity)							
Apartment building	1403	57.4	1002	40.9	41	1.7	—	—	2446	100
Hotel	1429	55.2	1057	40.8	104	4.0	—	—	2590	100
Office building	767	54.0	588	41.4	65	4.6	—	—	1420	100
Department store	97	9.9	594	60.5	290	29.6	—	—	981	100
			(Based on maximum demand)							
Apartment building	733	30.0	1134	46.3	548	22.4	31	1.3	2446	100
Hotel	458	17.7	1106	42.7	969	35.1	117	4.5	2590	100
Office building	376	26.5	616	43.4	364	25.6	64	4.5	1420	100
Department store	15	1.5	514	52.4	374	38.1	78	8.0	981	100

TABLE 12 — PERCENTAGES of total energy consumption (compressor only) by months are given here

Building	April	May	June	July	August	September	October
Apartment building	0	0	12.2	40.8	36.7	10.3	0
Hotel	1.8	3.9	21.8	31.8	29.4	11.3	0
Office building	3.0	5.8	18.6	29.4	27.2	11.0	5.0
Department store	1.8	5.0	22.1	25.5	30.0	13.5	2.1
Average	1.6	3.7	18.7	31.9	30.8	11.5	1.8

TABLE 13 — MONTHLY DEMANDS of compressors only are given below (along with percentages of maximum capacities)

Building	April		May		June		July		August		September		October	
Apartment building, kw	—	—	—	—	105.6	(100.0)	96.0	(90.8)	89.6	(84.9)	94.3	(89.2)	—	—
Hotel, kw	51.2	(62.8)	70.4	(86.2)	81.6	(100.0)	80.0	(98.0)	81.6	(100.0)	80.0	(98.0)	—	—
Department store, kw	225.0	(61.0)	202.5	(55.0)	301.5	(81.9)	369.0	(100.0)	355.5	(96.5)	283.5	(76.8)	130.5	(35.4)
Office building, (tons)	680.0	(68.0)	670.0	(67.0)	950.0	(95.0)	1000.0	(100.0)	950.0	(95.0)	810.0	(81.0)	540.0	(54.0)

TABLE 14 — ESTIMATED ENERGY requirements of refrigerating units in air conditioning systems studied are listed

				Energy input		Total energy	
Building	Loading	Tons estimated for full load requirement	Hours	Kw	Lb of steam	Kwhr	Lb of steam
Apartment building	¼	31.7	733	38	—	27,854	—
	½	63.3	1,134	58	—	65,772	—
	¾	95.0	548	80	—	43,840	—
	Full	126.5	31	103	—	3,193	—
						140,659	
Hotel	¼	17.5	458	23	—	10,530	—
	½	35.0	1,106	45	—	49,770	—
	¾	52.5	909	63	—	57,267	—
	Full	69.0	117	81	—	9,477	—
						127,044	
Office building	¼	250	376	—	3,475	—	1,306,600
	½	500	616	—	6,950	—	4,281,200
	¾	750	364	—	10,425	—	3,794,700
	Full	1000	64	—	13,900	—	889,600
							10,272,100
Department store	¼	104	15	77	—	1,155	—
	½	208	514	145	—	74,530	—
	¾	312	374	241	—	90,134	—
	Full	416	78	374	—	29,172	—
						194,991	

TABLE 15 — ACTUAL ANNUAL ENERGY requirements (metered) are compared with estimates made for four air conditioning systems studied

			Estimated requirements	
Building	Energy, units	Actual metered requirements	Energy	Deviation, percent
Apartment building	Kwhr	126,240	140,659	11
Hotel	Kwhr	120,960	127,044	5
Office building	Lb of steam	9,981,500	10,272,100	2
Department store	Kwhr	196,763	194,991	1

Data Obtained

Tables 5, 6, 7, and 8 give air conditioning system data for each of the four installations. Table 9 is a summary of the 1957 season operating data of the four test installations. In Table 10 are shown the maximum refrigeration loadings and the corresponding electric input experienced during the air conditioning season. This data shows that, in each installation, the total rated capacity of the system was not needed.

Total hours of air conditioning operation and the number of hours' use at partial loads are shown in Table 11. Partial load tonnages are developed from metered data on two bases: (1) installed capacity tonnage and (2) maximum demands.

The maximum demand basis for establishing hours of partial loads is best suited for estimating energy requirements of refrigerating units used in air conditioning systems. The refrigeration tonnage specified by the design engineer should be considered as that required for maximum cooling conditions which can be expected to exceed nominal design conditions.

Comparative total hours' use for each of the test installations seems justifiable. The apartment building and hotel are similar in occupancy and require air conditioning 24 hours of the day. The office building, on the other hand, operates on a ten- to 12-hr day, five days a week. Consequently, the hours that air conditioning is required, as shown by the metered data, are correspondingly less.

The business hours of the suburban department store, as shown in Table 9, are the least of the four metered installations and account for the smaller total hours of operation of the refrigerating unit. The consistency of hours of operation at partial load is remarkable, and shows that the partial load concept for estimating energy requirements is the only realistic approach.

In Table 12 is shown the proportion of total electric energy used in each month by the refrigerating compressor Monthly maximum demands established by the refrigerating compressors and their relationship to the maximum demand established for the season are shown in Table 13.

The relation of outdoor temperature and air conditioning requirements of the four systems was carefully studied. Figs. 1 and 2 plot the maximum daily temperatures and the percentages of seasonal maximum kilowatt input to the refrigerating unit motors of the apartment building and hotel air conditioning systems, respectively. The charts illustrate that there is a definite correlation between maximum daily outdoor temperatures and the requirements for air conditioning.

Energy requirements of the four refrigeration systems, both steam turbine and electric motor driven, were developed by the method earlier. Details are shown in Table 14. Actual metered energy requirements are compared with estimates in Table 15.

Results of Study Summarized

Summarized, the results of the study are:

1) The metered data obtained from the tests shows that the method of estimating energy requirements was within 1 percent to 11 percent accurate. The following table compares the metered results with the estimated results for each type of building.

Building	Actual metered requirements	Estimated	
		Energy	Deviation, percent
Apartment building	126,240 kwhr	140,659 kwhr	11
Hotel	120,960 kwhr	127,044 kwhr	5
Office building	9,981 M lb of steam	10,271 M lb of steam	2
Department store	196,763 kwhr	194,991 kwhr	1

2) Operating data shows that at no time during the test period was the total installed capacity utilized. The following table gives the relationship between the installed capacity and the maximum load attained in each case:

Building	Installed capacity, tons	Maximum load attained, tons	Demand factor, percent
Apartment building	170	126.5	74.5
Hotel	100	69.0	69.0
Office building	1400	1000.0	71.5
Department store	500	416.0	83.2

3) Based upon *maximum* load requirements, the percentages at which each of the four installations operated throughout the air conditioning season at various load levels (one-fourth, one-half, three-fourths, and maximum) were as follows:

Building	¼, percent	½, percent	¾, percent	Maximum
Apartment building	30.0	46.3	22.4	1.3
Hotel	17.7	42.7	35.1	4.5
Office building	26.5	43.4	25.6	4.5
Department store	1.5	52.4	38.1	8.0

4) Operating data of the four installations shows a relationship between operating hours and outdoor temperatures. Evidence of correlation between daily maximum outdoor temperature and percent of maximum kilowatt input to the refrigerating compressor is shown for the apartment building and hotel installations Figs. 1 and 2.

5) Operating data of the hermetic centrifugal compressor, graphically reproduced in Fig. 3, shows that the electric input to the motor is reduced in the same ratio as the cooling load is reduced. This result was accomplished automatically.

6) Results of the four test cases show that, for electric demand estimating purposes, the cooling requirements for the season may be considered as reaching maximum levels during each of the three months, at 75 percent levels in each of two months and at 50 percent levels during the two remaining months.

This information has been made available for publication in Heating, Piping & Air Conditioning through the courtesy of the Commonwealth Edison Co., Chicago.

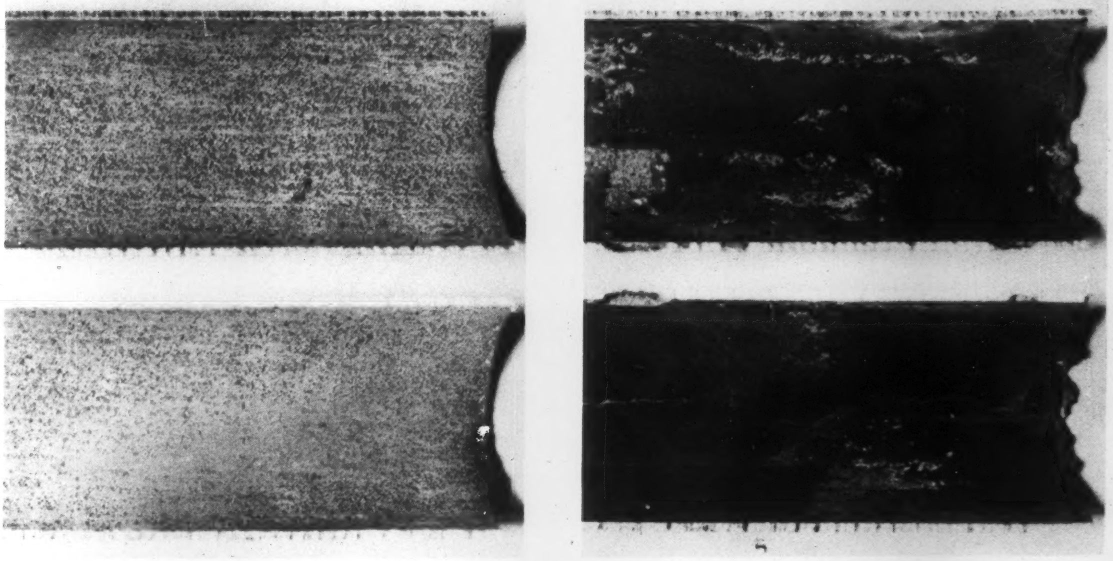


Fig. 1 Fig. 2

1-2 TYPICAL SAMPLES of corroded tubing, cut from sections removed from a new dormitory building at Michigan State University, are shown above

How Temperature and Velocity of Potable Water Affect Corrosion of Copper and Copper Alloys

. . . in heat exchanger and piping systems

• Despite the excellent corrosion-resistance characteristics of copper and copper alloys, the problem of corrosion still exists in heat exchanger and water distribution systems. Research conducted at Michigan State University and jointly sponsored by MSU and the corrosion committee of the Copper & Brass Research Association has revealed the corrosive effects of temperature and flow velocity on these systems. Herein is a report of these studies.

BY MALVERN F. OBRECHT
Water Treatment Consultant
and Professor of Chemical Engineering
and LAURENCE L. QUILL
Michigan State University

COPPER and copper alloy tubes have been used extensively for construction of heat exchangers and water distribution systems because of the excellent corrosion resistance of these materials through a wide range of environmental conditions. Copper water tube for water distribution piping has the added advantage of ease of installation since it can be joined by soldering. Nevertheless, these materials may corrode under certain adverse conditions.

One location at which such a corrosion problem became evident was at Michigan State University in about 1950 when a large construction program involving new dormitories, laboratories, classrooms, and other facilities had been completed. The water distribution systems installed in these buildings were of Type L copper water tube. Within a few months, a large number of failures, appearing as leaks, caused great concern. Conferences of university and industry representatives were held to study the abnormal situation.

The approach to the problem consisted of (1) examining samples of corroded tube removed from distribution systems and heat exchangers, (2) re-

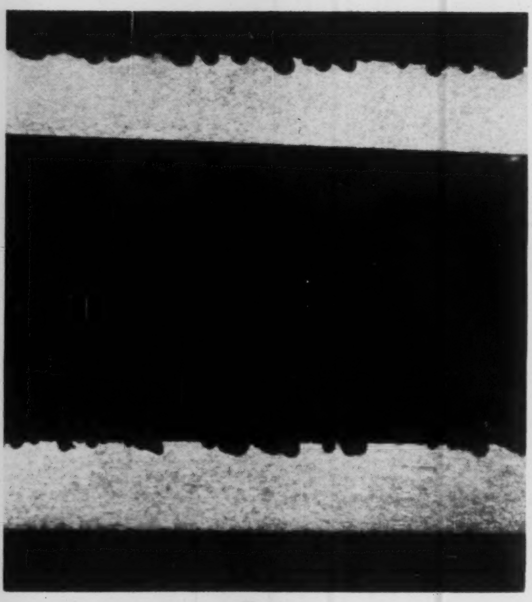


Fig. 3

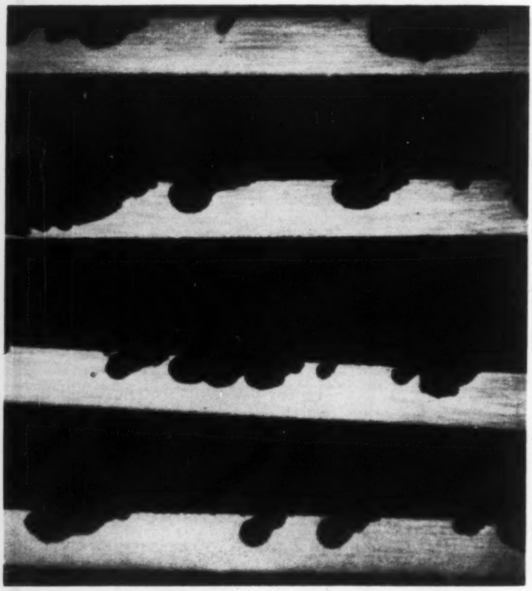


Fig. 4

3-4 EVIDENCE of considerable corrosion-erosion can be noted from the undercuttings pictured here. Fig. 3 shows lengthwise section of tube illustrated in Fig. 1 (10X) where flow is from left to right. Fig. 4 is similar view of section shown in Fig. 2 (also 10X) where flow is from right to left

viewing analyses of raw and treated waters, and (3) studying available information on existing temperatures and velocities. The resulting discussion indicated that there were two aspects to the overall corrosion problem: (1) a practical one pertaining to the most suitable operating conditions to protect a water distribution system from deterioration for a given or local situation; and (2) the fundamental one on why the corrosion occurs where and when it does.

Leaks Evidenced After Only 6 Months

The existence of the corrosion problem at MSU became evident about six months after several new buildings had been completed and new wells added to the water supply system. Leaks began to appear in the campus water distribution systems of the new dormitories and of service buildings such as the student union and Kellogg Center. During a period of two and one-half years, over 40 leaks were reported in one of the new dormitory buildings, Gilchrist Hall.

Sections of copper tube removed from the various buildings showed severe localized pitting. Although most of the corrosion was taking place in the hot water distribution system, some corrosion was occurring in cold water lines.

In contrast to the rapid corrosion rates observed in the new buildings, the copper corrosion rates were relatively low in the installation in use before 1941.

Water used in the campus system is a mixture of waters from various wells. In each building, the water is sodium zeolite softened. Part of the water is heated and pumped through the hot water systems of the buildings. In newer buildings the softeners were put into service at the time of initial occupancy; in the older buildings they were installed after the buildings had been in service for many years. Also in the older buildings, regeneration of the softeners was very infrequent.

Relative to the operation of water softeners, it is well to introduce a concept about water treatment since it is an aspect of the environmental conditions. There has been an increasing use of zeolite for water softening which removes calcium and magnesium ions and prevents the formation of a protective film on the metal surface. This softening increases the corrosion hazard with some waters.

Observe Effects of Water Softening

Briefly, a few observations as background about corroded samples of copper tube and of water analyses will be outlined. Examination of tubes removed from dormitory hot water systems in the older buildings indicated that a protective film had been laid down on the inside walls of the systems previous to the time that the water softeners were placed in operation. The protective film was a hard, thin, adherent carbonate-silica deposit. Tube samples from the new buildings were devoid of this protective film.

Typical samples of corroded tube, cut from sections removed from Gilchrist Hall, are shown in Figs. 1 and 2. The occurrence of considerable corrosion-erosion can be noted from the undercutting pictured

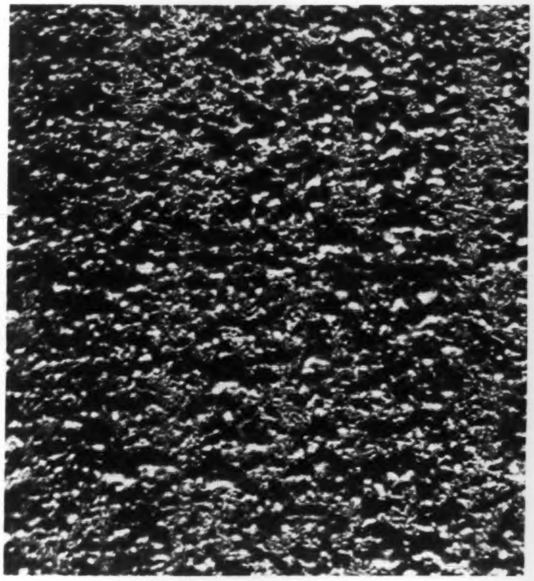


Fig. 5

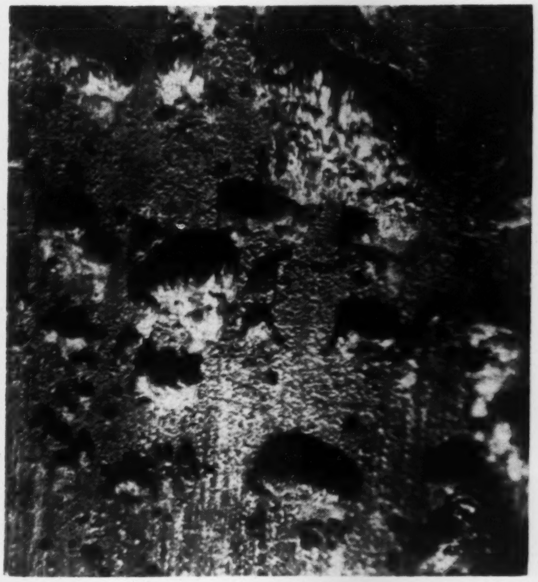


Fig. 6

5-6 PITTINGS on inner surfaces of tube sections illustrated in Figs. 1 and 2 (and Figs. 3 and 4), respectively, are pictured above. Flow is from bottom to top

in Figs. 3 and 4. Further views of the corroded surfaces are shown in Figs. 5 and 6.

Sectioned specimens from other failures showed deep pitting localized in a longitudinal direction and indicated only slight corrosion-erosion. These observations suggested that the severe pitting occurred in part as a result of chemical attack. Our theory was that, since this failure occurred at the top inner surface of the tube which had been in a horizontal position, the longitudinal distribution of pits occurred as a result of an accumulation of gases such as carbon dioxide and oxygen.

Analysis of the adherent film of corrosion products on the inside surface of this sample indicated large amounts of cupric and iron oxides, silica and basic copper carbonates, with lesser amounts of chlorides and sulfates and trace amounts of calcium salts. That the water which flowed through this tube was softened was revealed by the small amount of calcium salts in the corrosion product film.

Velocity Abets Chemical Attack

In reviewing the question of occurrence of failures *vs* location, it was evident that there was a direct correlation between the frequency of failures and the service demand for water. In turn, it became evident that, in those locations where many leaks were found, high flow rates of water were necessary to meet the demand. Observation of all failed samples of the corroded copper tubes indicated a velocity effect in addition to the chemical attack.

In addition to the failures in the water distribution system, failures resulting in leaks occurred in the coils of booster and hot water heaters. These heaters are a part of the hot water distribution systems in different campus buildings. All the heat exchangers are shell-and-tube type, with copper tubes being used for the heat transfer surfaces. In some of the exchangers, water flowed on the shell side; in others, through the tubes.

Studies of disassembled heat exchangers showed that severe localized pitting had occurred on the outside of many tubes beneath the baffles where broad areas of shallow corrosion-erosion were found. These corroded areas faced the path of hot water flow through the heater. High velocity of flow of corrosive hot water through the annular spaces between the tubes and baffle plates, and around the plates was considered to be the cause for the observed corrosion-erosion.

The numerous failures in heat exchangers appeared to be due to a combination of factors—aggressive water, high water temperatures, and excessive flow rates.

Figs. 7, 8, and 9 record the effects of corrosion-erosion on some hot water heat exchangers. Since water temperatures and velocities cannot be altered appreciably in the heat exchangers, the nature of the water is an important factor in decreasing the corrosive action.

The raw water used at Michigan State is a well water of high hardness, predominately a temporary hardness, and contains an appreciable carbon dioxide content. Total hardness of water from the 13 wells on the campus averages 330 to 380 ppm as calcium carbonate. Analyses of laboratory-prepared blends of the raw well water and of softened water provided data which showed that blends with a high percentage of raw water had positive Langelier indices* under hot water service conditions. Water having a positive Langelier index is known to have a film forming tendency and to be less corrosive (due to the protection afforded by the film) than a water with a negative index. The softened water, under all temperature conditions, had a negative Langelier index and therefore had a tendency to establish corrosive conditions.

The Langelier index only gives an indication of the tendency of a water to form a protective calcium carbonate scale or film. It does not take into account the quantities of film formed, the effect of velocities, oxygen, carbon dioxide, ammonia, silica, or natural inhibitors in the water, nor the effect of trace ions or electrolytes in solution.

From the results of the few laboratory investigations cited and numerous field observations, it was obvious that several factors were active in promoting the failures. However, it was difficult to separate the effects of temperature, velocity, and water aggressiveness from each other, and to determine whether one of these was the most responsible factor or whether two or more of these factors were necessary in combination to cause failure.

Launch Joint Research Program

This corrosion problem became the basis for many discussions by members of the university staff and the corrosion committee of the Copper & Brass Research Association. From these meetings evolved a research program which was to be carried out on the MSU campus.

The program was resolved into the two problems of (1) consideration of methods for alleviating and controlling corrosion (this phase of the program, being basically a local problem, was initiated and carried out by the university), and (2) determination of the reasons for the accelerated corrosion of the copper and copper alloy tube used in water distribution systems and heat exchangers (this phase, being concerned with the fundamental behavior of copper and copper alloy tube in relation to various types of waters, became a joint study sponsored by CABRA and MSU).

The overall study of corrosion in a water distribution system carried out within the framework of this program is unique. It was the first study in which the progress of corrosion on the inner surfaces of copper water tube has been observed continuously under extensive and controlled service conditions.

With respect to measures for alleviating the excessive corrosion, a preliminary study was made of the operating conditions responsible for the corrosion and its probable cause. Based on this study the following changes were made by the university to reduce the number and severity of failures occurring in the distribution system.

1) Temperatures in the hot water systems were limited to a maximum of 140 F.

2) Soft and hard waters were blended to maintain a moderate film-forming tendency, as indicated by holding a slightly positive Langelier index.

3) Recirculation pumps in the hot water distribution systems were bypassed, thus eliminating or reducing their high velocity effect.

4) Regeneration procedures for zeolite softeners were improved, with particular attention being paid to the rinsing away of residual chlorides.

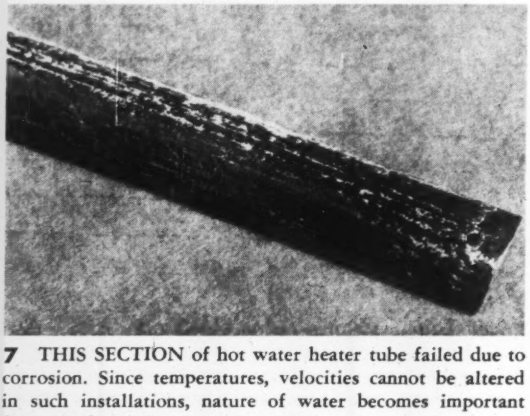
5) Carbon dioxide content of the water was neutralized by the addition of alkaline chemicals to the raw water supply.

These five corrective measures, when put into practice, substantially reduced the number of failures.

Install Corrosion Test Units

To provide a means of monitoring the effect of this corrective program, NDHA-ASTM copper corrosion test units were installed in 45 locations before the program was begun. Also, strip testers were installed at various locations in order to measure the rates of corrosion on larger surface areas. These test units were also installed in actual service systems so that they would be subjected to the same flow conditions as the tube used in the system.

The effectiveness of the corrective program can be illustrated by comparing the effects on the testers



7 THIS SECTION of hot water heater tube failed due to corrosion. Since temperatures, velocities cannot be altered in such installations, nature of water becomes important factor in decreasing corrosive action

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*Langelier index is the calcium carbonate saturation index. It is a measure of tendency for calcium carbonate to precipitate from water.

8 OUTER SURFACE near baffle plate of this hot water heater tube (magnified 6X) is gouged by corrosion

9 HOT WATER heater tube pitting under baffle plate is evidenced above (6X)

before and after the program was put into use. Prior to the start of the program, a considerable corrosion of the testers was noted; after the program had been established, the corrosion rate approached a minimum, as determined by loss of metal. Occasional failures still occur in locations where all five corrective measures were not applied.

Another phase of the exploratory and control program involved the installation of a number of field test panels at various locations in the distribution system so that the effects of water actually being used could be observed. These field test panels, installed in March 1955 in several different buildings on campus, consisted of "trains" of copper tube arranged in an order of decreasing diameters so that the velocity of the water could be varied.

In some of the panels the direction of the flow was toward the decreasing diameters and, in others, toward the increasing diameters. Both vertical and horizontal installations of these field panels were utilized. The panels were inserted into the water system being used in each building to provide test conditions comparable to actual operating conditions.

Samples of the water entering and leaving each of these test sections were analyzed for hardness, pH, copper and iron pickup in the panel, and concentrations of carbon dioxide and oxygen. To determine the extent of corrosion, the complete panels were periodically removed for observations of the inside tube walls. After approximately 1300 days of operation, these field panels were dismantled and the tubes cut into sections for more detailed study. The inside walls of these tubes showed no excessive pitting nor corrosion and provided evidence that the suggested corrosion control program was yielding satisfactory results.

An extensive program to determine the reasons for the severe corrosion-erosion attack was initiated concurrently with the aforementioned program. This part of the study involved the installation of numerous test panels, designated as main test panels (MTP's), which could be operated under various controlled conditions. Each panel had its own complete pilot plant for individual control. These MTP's were designed to observe the effects of temperature, flow velocity, and water composition.

The main test panels and the field panels were similar in that they both consisted of tube trains. However, the MTP's were a series of tube trains arranged in connected loops, six loops to a panel.

The temperature and velocity parameters to be studied were provided for in the construction of the panels. Each loop of the panel incorporated heat exchangers and the various diameter tubes in each loop provided the desired range of velocities.

Nine main test panels were operated for periods of time ranging from 324 to 632 days. These panels were used to study the effect of various methods of pretreating water (namely sodium zeolite and lime soda softening, blending, and deaeration) on the corrosion resistance of various alloys.

Results from observations of the MTP studies proved the basis for the following statements:

1) Corrosion is greatly reduced by the use of blended water.

2) Deaeration reduces pitting tendency.

3) Corrosion-erosion appears to be the net result of temperature, velocity, and water composition.

4) Both copper and red brass (85 percent) are adversely affected by high water velocities and high temperatures of sodium zeolite softened water containing oxygen and carbon dioxide. ∓

HUGE, ONE-STORY Chevrolet engine plant, completed in 1954, epitomizes industrial building design trend toward automated manufacturing facilities. Remedial changes in heating, ventilating systems after plant was already in production improved employees' environment

INDUSTRIAL VENTILATION:

Plant's Revamped Supply Air System Gives Workers Year 'Round Comfort

● The study and changes incorporated in this modern industrial plant for environment control clearly indicate that modern buildings have inherent heating and ventilating problems that cannot be ignored if the full benefits of automation are to be realized. In solving these problems, the basic concept must be recognized that man is a warm-blooded creature and needs not be heated but rather to have his rate of cooling controlled. The steps taken here to provide controlled environment for worker comfort are described in this article.

Mr. Robinson, a member of Heating, Piping & Air Conditioning's board of consulting and contributing editors, has had about 25 years' experience in the industrial ventilation field. While associated with the Michigan department of health he was chairman of the committee that formulated the Industrial Ventilation Manual and was active in originating the Industrial Ventilation Conference which is held at Michigan State University each February. Today he is consultant to GM plant engineers on industrial ventilation problems.

BY K. E. ROBINSON
Ventilation Engineer
General Motors Corp.

In THE design of the Chevrolet engine plant at Flint, Mich., every effort was made to provide a heating system superior to that of the average industrial plant. Placed in production in late 1954, the building—specifically designed along modern trends for automated manufacture—is a low, flat, one-story structure. It covers an area of 1,008,000 sq ft, with 16 ft below the lower truss and 6 ft from the truss to the flat roof.

The roof is broken only with a monitor section housing the cafeteria and 15 penthouses containing the heating systems. In each penthouse, arrangements were incorporated so that air could be drawn into a return air plenum either from outside or from the plant, with the quantity from each source being selected by the operating engineer at a remote location. The air was then drawn through traveling oil filters and finally steam heating coils.

Following the steam coils was a fan rated at 50,000 cfm which forced the air through a duct system into the plant. The ducts were installed directly beneath the roof and spanned the plant at about 90 ft intervals. Discharge outlets were composed of short sections of piping fastened in pairs to the main duct and directed downward about 30 deg. The terminus of the duct was a rectangular outlet to spread the air over a greater area.

Temperature control consisted of remote manual operation for adjustment of the outside and recirculating air dampers, as previously mentioned, and modulation of the steam valve by a duct thermostat in the discharge air stream.

When the plant began operation, there was no general exhaust equipment; only process exhaust systems capable of removing approximately 750,000 cfm of air to control toxic and nuisance dust and fumes from the manufacturing operations. It was expected that satisfactory conditions would prevail with the system because the tempered supply air would prevent the problems which develop when plants are operated under vacuum. The supply system as designed was also expected to prevent stagnant air and the automatic control system to provide a satisfactory environmental temperature.

Reveal Winter Shortcomings

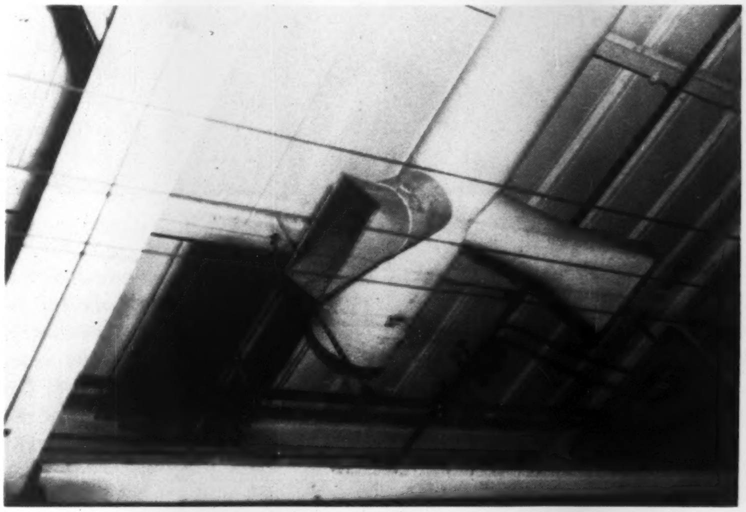
When the plant was in production, the heating and ventilating systems were evaluated by George Baker, plant engineer. He determined that the following winter conditions prevailed:

1) The area near the exterior of the plant was cold, since very little of the warm air was projected toward the cold walls (which were primarily glass). With the air being distributed from both sides of the ducts, the controls could not be adjusted to provide desired temperatures along the outside wall and in the interior of the plant simultaneously.

2) Even though considerable heat was generated by plant operations, the temperature of the supply air had to be 80 F or higher to eliminate undesirable drafts.

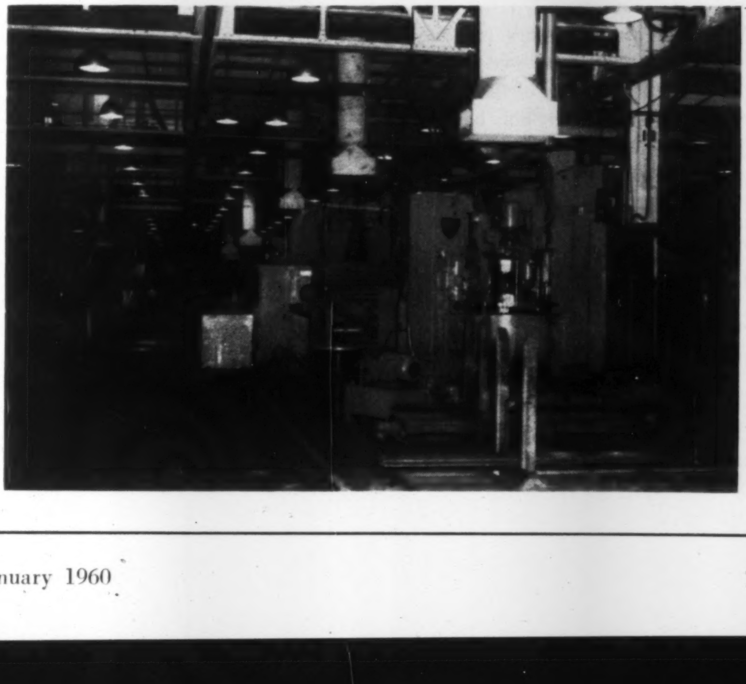
3) The remote controllers for the adjustment of the outside air dampers were not automatic and were difficult to keep adjusted properly for the manufacturing conditions. When the amount of air from outside was re-

before



IN ORIGINAL DESIGN, air discharge outlets were composed of short sections of duct fastened in pairs to main duct and directed downward at about 30 deg. With air distribution from both sides of ducts, controls could not be adjusted to provide uniform temperatures along outside wall and in interior of plant simultaneously. Also, supply air temperature had to be 80 F or higher to eliminate undesirable drafts

after



EXISTING DISCHARGE openings were sealed and, in place of two openings in original design, single ducts were dropped to 10 ft above floor level. Easily adjustable outlets permit air at 1600 fpm velocity to be directed as circumstances dictate

CONTINUOUS GRAVITY ROOF EXHAUSTERS were installed for smoke and heat release in case of fire and to remove heat from plant during summer. Air flow through units is based on air temperature 20 F above outdoor conditions. Employees can open or close ventilators for individual comfort

duced, the plant was under a vacuum. The negative pressure increased infiltration and aggravated the cold condition around the exterior of the building.

4) Additional exhaust equipment had been installed so that, even with all outside dampers open, the building was operating under a slight vacuum. This caused an increase in the cold drafts at doors and windows.

All of the above factors resulted in undesirable drafts and cold conditions around the exterior of the plant. These conditions could not be improved with the existing installation without raising the temperature in the center of the plant to above 80 F.

Summertime Problems, Too

Studies carried out in the summer to evaluate the effectiveness of the installation revealed that:

1) Even when 100 percent outside air was being admitted through the supply system, there was no significant sensation of air motion.

2) Although the local exhaust systems were handling in excess of the 750,000 cfm provided by the supply system, the heat from the electric motors and the various plant processes rose to the upper section of the plant where it was entrained by the incoming air and forced downward again to increase the air temperature in the occupied zone.

3) There were no roof ventilators in the building and no means for the heated air to escape.

4) When the outside air cooled as a result of local weather changes or at night during the second shift, no reduction in temperature could be noticed or measured within the plant.

5) Calculation of the heat gain in the building during production hours was estimated in excess of 100 million Btu per hr. Of this, some 85 million was process load (connected electrical load and steam washers).

Explore Corrective Methods

Since construction, provisions to automatically vent the heat and smoke in case of fire had become an essential part of industrial building. Management wished to include such control, as well as to change the existing heating and ventilating systems to improve the control of plant environment. To do this, the following were considered:

1) Providing heat near the exterior walls of the building to eliminate the cold surfaces to which body heat would radiate.

2) Supplying sufficient air to eliminate the vacuum and possibly slightly pressurize the building, thereby reducing objectionable cold drafts.

3) Providing air in the various parts of the building at a suitable temperature with minimum air motion so as not to increase the cooling rate of the individual during the heating cycle.

4) Delivering, through ductwork, outside air as close as possible to the space occupied so as not to entrain heated air from within the building.

5) Providing a simple adjustment in the air distribution system which would facilitate supplying high air motion in the vicinity of the employ-

ees during warm weather and thereby increase their cooling rate.

6) Providing heat relief to the building itself in order to reduce the temperature of the space directly above the working area.

Tests were conducted in the plant to study various types of supply outlets, heights of air discharge, and the benefits that might be obtained with power roof exhausters. The most satisfactory combination seemed to be a supply outlet located 10 ft from the floor which permitted discharging the air horizontally in winter and, by simple adjustments, would permit air to be discharged downward at 45 deg to give high air motion in summer. The power roof exhauster did not influence the air that was two or three fan diameters below the fan entrance and no dependable results could be expected from the use of exhausters alone in removing high temperature air from the plant.

These Changes Were Made

After considerable study, the following changes were made:

1) The heating units were changed to supply 100 percent outside air while the plant was in production. This required the addition of more steam coils for extreme weather conditions.

2) An electronic control system was installed. All adjustments are now made only by trained personnel. Only personnel having keys to the penthouse and to the control cabinet can make changes.

3) Face and bypass dampers were installed on the steam coils to permit closer control of the temperature of the air leaving the coils.

4) The existing discharge openings on the ducts were sealed and, in place of the two openings in the original design, one duct was extended downward to 10 ft from the floor. Easily adjustable outlets were installed on each side of the duct so the air can be directed on the employee or over his head as circumstances dictate. These were sized to discharge the air at a velocity of 1600 fpm minimum.

5) New air supply units were installed to blanket the exterior walls and doors with tempered outside air.

6) Continuous gravity roof exhausters were installed. These are 4 ft wide at the base and are of different lengths in increments of 48 ft and 108 ft. A total of 5400 lin ft of these units was installed. They were designed and sized to meet the requirements for smoke and heat release in case of fire and to exhaust heat from the plant during the summer. Air flow through the units is based on an air temperature 20 F above outdoor conditions. In general, they are installed in an even pattern across the roof, with the exception of a few places where extremely high heat release was anticipated from the production being carried on below. Controls for the exhauster dampers are carried to the production floor so the employees can open and close them at will. However, fire linkage would open the units in case of excessive temperatures which might occur in case of fire within the plant.

Results Weighed Carefully

Since completion of the changes, the results have been carefully observed and many measurements taken to determine if the anticipated results have been accomplished. During the winter months it is now possible to supply air to the production areas at 68 F rather than 80 F, as was formerly necessary.

In some cases, objectionable drafts resulted because the new outlets could not be adjusted to direct the air above the horizontal. This problem was solved by installing some of the grilles upside-down during winter months. The outlets have now been redesigned and are adjustable to project the air both above and below horizontal. By bringing the air in and distributing it horizontally, or slightly upward at the lower temperature, the plant is more comfortable and the steam load is reduced.

The electronic control system has worked very satisfactorily and, with the addition of the face and bypass dampers, constant temperature air can be delivered to the plant.

As mentioned, the gravity ventilators can be operated by plant employees at will. However, if they are observed to be open during cold weather, the engineer reduces the air temperature to that section of the plant. As the temperature is lowered, the employees close the ventilators, thus saving heat that would otherwise be wasted to the outdoors.

The additional supply systems maintain the plant under a slight pressure and, because of their location, have eliminated the cold areas along the exterior walls.

Summer Benefits Even Greater

In summer the benefits have been even more pronounced. All air is discharged downward on the employees, giving them the benefit of high air motion as well as uncontaminated outside air. This air supply, coupled with the venting of hot air by the large number of gravity exhaust systems, has resulted in a satisfactory environment.

Many temperature readings have been taken since the installation was modified. In the heaviest production areas, temperatures of only 1 to 2 F above outside temperatures have been consistently recorded.

Delivery of the air down to the 10 ft level has resulted in two benefits that are often ignored: (1) The same quantity of air that in theory will provide four air changes per hr when the air is discharged at the 20 ft level will actually give eight air changes per hr to the occupied zone when properly distributed at the 10 ft level. (2) Whenever there is a reduction in outside air temperature, it is directly reflected to the employees within the plant. These benefits are over and beyond that of providing flowing air to the employees and of diluting any fume, smoke, or heat that is generated in the occupied zone and immediately pushing it upward and out of the plant.

The improvements within the plant as a result of the changes outlined have been considered of sufficient value that other plants constructed since by the Chevrolet Div. have had them incorporated in the original design. ⌗

STEAM:

What every engineer should know

Most of us in our work have more than a nodding acquaintance with steam. But even so, it might be well to brush up on its fundamentals —its basic physical properties, how it is used, etc. Willie Hammer, a frequent contributor to Heating, Piping & Air Conditioning, has prepared, in interesting question-and-answer form, this short refresher course on this vital heat source.

BY WILLIE HAMMER
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Q: What is absolute temperature?

A: Temperature measured from the point at which molecular action ceases and the presence of internal heat energy is nil. This point is zero in degrees Fahrenheit absolute or degrees Rankine and is −460 F on the standard Fahrenheit scale. Thus, 32 F (t) is 492 F absolute (T) or 492 Rankine (R).

Q: What is the difference between heat and temperature?

A: Heat is a form of energy. Temperature is a measure of amount of sensible heat.

Q: What is sensible heat?

A: Heat which causes a change in temperature of a substance, but no change of phase.

Q: What is meant by "change of phase" and "change of state"?

A: A change of phase occurs when a substance changes from solid to liquid, liquid to gas, solid to gas, or vice versa. A change of state occurs when the properties of a substance such as temperature, pressure, or volume change.

Q: What is enthalpy?

A: The amount of heat energy contained in a substance, measured from a prescribed reference point. For water, the reference point at which enthalpy is zero is 32 F at standard atmospheric pressure.

Q: What is the difference between heat and enthalpy?

A: These terms are sometimes used interchangeably, since both are measures of the same form of energy. But they use different reference points. A substance has zero heat content at zero F absolute, whereas saturated water has zero enthalpy at 32 F. The use of enthalpy simplifies computations.

Q: What is standard atmospheric pressure?

A: By international agreement, standard atmospheric pressure (or a standard atmosphere) is the weight of the atmosphere at sea level on an area of 1 sq in. at 45 deg latitude. This is 14.696 psi (usually taken as 14.7 psi), or 29.221 in. Hg at 32 F.

Q: What is absolute pressure?

A: Pressure measured from the absolute zero at which no molecules of gas are present. Absolute pressure in pounds per square inch is usually abbreviated as "psia." Equations and tables are usually in absolute pressures.

Q: What is barometric pressure?

A: Atmospheric pressure at any certain time and place. Barometric pressure changes with weather conditions and decreases with increase in altitude.

Q: What is gage pressure?

A: The pressure reading of a mechanical device. Usually abbreviated "psig," it is pressure above the atmospheric. Gage pressure plus atmospheric pressure equals absolute pressure. For example, atmospheric pressure indicated by a barometer at a certain point is 14.6 psi and a gage reads 105 psi. Absolute pressure is 105 + 14.6 = 119.6 psia.

Q: What is the relationship between pounds per square inch and inches of mercury?

A: One in. of mercury equals 0.491 psi. For example, barometric pressure is 29.80 in. Hg. This is equal to 29.80 × 0.491, or 14.63 psi.

Q: What is vacuum when referring to pressure readings?

A: Vacuum is pressure below atmospheric. It is usually measured in inches of mercury or water. Assuming a standard atmospheric pressure of 29.92 in. Hg and a gage pressure reading for a condenser of 24.60 in. Hg, what is the absolute pressure? Absolute pressure equals (29.92 − 24.60) × 0.491, or 2.61 psia.

Q: When are inches of water used?

A: When pressure readings are very small. One in. of water equals 0.7355 in. Hg, or 0.03613 psi. Thus, if a draft gage reading of a furnace was 0.8 in. WG, it would be only 0.059 in. Hg, or 0.029 psi — too small to be read on a standard pressure gage.

Q: Why are cast iron hot water boilers sometimes unfeasible for use in tall buildings?

A: One ft WG exerts a pressure of 0.434 psi. A building having the top of its hot water system 120 ft above the boiler to which it is connected would exert a pressure of 120 × 0.434, or 52.1 psi. This would probably eliminate the use of cast iron boilers, or of cast iron radiators, except on the topmost floors.

Q: What method could be used in tall buildings if it is desired to have a circulating hot water system using cast iron boilers?

A: Steam could be generated in the boiler and piped to heat exchangers from which hot water could be pumped. This would relieve the hydrostatic pressure on the boiler.

Q: Is there any mathematical relationship between heat and temperature?

A: Engineers, to represent changes of energy in heat flow, sometimes use a function called *entropy* which gives the desired result when charted against absolute temperature. The relationship at any point is: Heat equals entropy times absolute temperature, or change in heat equals change in entropy times absolute temperature at that point.

Q: How is entropy measured?

A: Entropy cannot be detected nor measured since it is a theoretical function or property. Since it is related to heat and therefore to enthalpy, which is zero at 32 F and standard atmosphere for a water-steam system, entropy is also zero at that temperature. Entropy has no units; values in steam tables are given under the symbol s and are usually called *units of entropy*. Strictly speaking, heat divided by temperature would give Btu per pound per F.

Q: What is Btu?

A: Btu, an abbreviation for British Thermal Unit, is the average amount of heat required to raise the temperature of 1 lb of water 1 F under a standard atmosphere.

Q: What is specific heat?

A: The number of Btu required to raise the temperature of 1 lb of a substance 1 F.

Q: Are the specific heats of substances constant?

A: No. They vary with pressure, temperature, and expansion. However, mean specific heats of solids and liquids over a certain range can be considered constant for normal usage. The specific heats of gases vary greatly, depending on whether or not heat is added while the gases stay at constant volume (c_v) or constant pressure (c_p). For example, the specific heats of air at or near standard conditions are $c_v = 0.172$ and $c_p = 0.241$.

What is "latent heat of vaporization"?

Q: What is the specific heat of water?

A: Between 32 F and 212 F, 1 Btu is the *average* amount of heat required to raise the temperature of water 1 F. Because of this, its specific heat is normally taken as 1.0. Actually, it varies as follows: 1.00738 at 32 F, 0.99795 at 94 F, 1.008 at 212 F, and 1.0423 at 500 F.

Q: Does the specific heat of superheated steam follow the same rule?

A: The specific heat of superheated steam varies like that of a perfect gas and increases with pressure and decreases with temperature.

Q: What are the specific heats of some common solids?

A: Aluminum — 0.230; asbestos — 0.195; copper — 0.093; cast iron — 0.130; steel — 0.118; wood — 0.330.

Q: How much heat is required to raise the temperature of a 5 lb bar of cast iron 150 F?

A: $H = c\ W\ (t - t_o) = 0.130 \times 5 \times 150 =$ 97.5 Btu.

Q: If a 50 lb piece of steel at 1200 F is dropped into a tank holding 480 lb of water at 80 F, what will be the resultant temperature? (Neglect the mass of the tank and other losses.)

A: $0.118 \times 50 \times (1200 - t_o) = 1.0 \times 480 \times (t_o - 80)$. From which the final temperature, t_o, is 93.6 F.

Q: What is "latent heat of vaporization"?

A: Latent heat or enthalpy of vaporization is the heat required to produce a change of phase from liquid to gas without a change in temperature. It is potential energy in the form of a change in the internal constitution of a substance produced without rise of temperature when vaporization takes place by the absorption of heat.

Q: How does the heat of vaporization cause a change of phase?

A: It overcomes the attraction between molecules of water at the vaporization temperature (internal latent heat) and provides the energy necessary to change the volume of 1 lb of water to that of 1 lb of steam (external latent heat).

Q: When considering a water-steam system, what is the relationship between sensible heat, latent heat, and pressure?

A: As pressure increases, the evaporation temperature increases, necessitating additional sensible heat to reach the boiling point. At the same time, the amount of latent heat required to vaporize the water is reduced. For example, at 100 psia, 1 lb of water contains 298.4 Btu per lb at the evaporation temperature and requires 888.8 Btu per lb of latent heat to change phase. At 300 psia, 1 lb of water contains 393.8 Btu per lb at the point of vaporization and requires 809.0 Btu per lb of latent heat to change phase.

Q: Is there a point where no latent heat of vaporization is required to produce a change of phase?

A: Yes. With steam this is the "critical point" at 3206 psia (critical pressure) and 705.4 F (critical temperature).

Q: Have any boiler plants been built utilizing this fact?

A: Yes, a number have been built using much higher, or "supercritical" pressures.

Q: Is it ever possible to have water and steam in the same line or vessel at different pressures and temperatures while in contact?

A: No. As long as the water and steam are in contact with each other they will have the same temperature and pressure. The application of additional heat in a closed vessel will cause additional boiling, increase in pressure and increase in boiling temperature. To increase the temperature of steam above that of water, it must be removed from contact before additional heat is applied.

Q: What is dry saturated steam?

A: Steam which contains neither entrained moisture nor superheat. For every pressure at which steam exists there is only one temperature at which it is dry saturated.

Q: What is saturated liquid?

A: For each pressure at which a liquid exists, there is one, and only one, temperature at which it will boil. When the liquid is at such a temperature and pressure it is said to be saturated. For example, water at 14.7 psia has a boiling point or saturation

Why is it necessary to know steam quality?

temperature of 212 F. Water at that pressure will not boil until it reaches that temperature.

Q: Sometimes water exists at atmospheric pressure at temperatures lower than boiling. Is there a special terminology for it then?

A: A liquid which is at a temperature less than the saturated for the existing pressure is called subcooled or compressed. The terms may be looked at as follows: If water in an open jar had a temperature of 90 F it would be 122 F below the saturation temperature for a standard atmosphere and could be regarded as having been cooled. Or, according to the steam tables, the pressure at which water is saturated at a temperature of 90 F is 0.7027 psia. Since the pressure is actually 14.7 psia, the water may be regarded as under compression.

Q: When a property such as enthalpy of subcooled or compressed water is to be obtained, is it determined from the temperature or the pressure?

A: From the temperature. The water is regarded as saturated at that temperature, and at low pressures, values may be taken directly from the steam tables. At pressures greater than 200 psia, corrections must be made for accuracy.

Q: What is a Mollier chart for steam?

A: The Mollier chart for steam is an enthalpy-entropy diagram on which changes of state can be plotted. It is usually used in conjunction with the steam tables. Besides enthalpy and entropy, the Mollier diagram shows pressure, temperature, quality or moisture, and superheat.

Q: What is the difference between vapor, gas, and entrained moisture?

A: The terms vapor and gas are very frequently used interchangeably. However, when a substance is near the point of condensation and does not follow the perfect gas laws with any close degree of accuracy, it is usually called a vapor. When it is in a dry condition in which it follows fairly closely the gas laws for changes of state, it is a gas. Entrained moisture consists of fine particles of liquid in a vapor which have not undergone a change of phase to gas.

Q: What is steam quality?

A: The percentage of dry gas present in a steam-water vapor mixture. It is usually represented by the symbol x and is related to moisture content, m, by the equation $x = 1 - m$ when both are expressed as decimals.

Q: Why is it necessary to know steam quality?

A: When steam is dry, its enthalpy, entropy, and specific volume can be determined when only temperature and pressure are known. If steam is wet, the moisture present has not undergone a change of phase from liquid to gas; therefore, steam table data for enthalpy, entropy, and specific volume of dry gas must be corrected for the liquid portion of the mixture. To do so, the quality must be known.

Q: Can you give an example?

A: Example: What are the enthalpy, entropy, and specific volume of steam at 150 psia if quality is 98 percent? Using values from the steam tables ($_f$ = liquid, $_g$ = gas or vapor, and $_{fg}$ = change from liquid to gas):

Enthalpy = $h = h_f + h_{fg}$ (using quality)
$= 330.5 + 0.98 \times 863.6 = 1176.8$ per lb

or

$h = h_g - m\,h_{fg}$ (using moisture)
$= 1194.1 - 0.02 \times 863.6 = 1176.8$ per lb

Entropy = $s = s_f + x\,s_{fg}$ (using quality)
$= 0.5138 + 0.98 \times 1.0556 = 1.5483$

or

$s = s_g - m\,s_{fg}$ (using moisture)
$= 1.5694 - 0.02 \times 1.0556 = 1.5483$

Specific Volume = $v = x\,v_g + m\,v_f$ (using quality and moisture)
$0.98 \times 3.015 + 0.02 \times 0.018 = 2.955$ cu ft per lb

or

$v = v_g - m\,(v_g - v_f)$ (using moisture)
$= 3.015 - 0.02\,(3.015 - 0.018) = 2.995$ cu ft per lb

Q: What is the difference between "steam quality" and "steam purity"?

A: Quality refers to the dryness of steam. Purity refers to the presence of entrained solids.

Q: What is a steam calorimeter?

A: A steam calorimeter is a device to determine the quality of steam. There are two types: throttling and separating.

Q: What is meant by the throttling of steam?

A: This is a process in which steam passes through an orifice or globe valve from a region of one pressure to another of lower pressure. There is comparatively little loss in heat energy in the process,

What is the advantage of using superheated steam?

but there is a reduction in the amount of work which can be performed by the steam. When such a process takes place in which heat is neither lost nor added, it is termed *adiabatic*.

Q: When is throttling used?

A: To increase the quality of steam or to superheat it. It is used this way in the throttling calorimeter. Also, it is used for control of equipment such as engines and turbines.

Q: How does a throttling calorimeter work? When is it used in preference to a separating calorimeter?

A: In a throttling calorimeter, the high pressure steam whose quality is to be determined passes through an orifice into a region of atmospheric pressure where its temperature is measured. During the throttling process the steam becomes dry saturated or superheated. Since the temperature and pressure are known, the heat content of the dry steam can be determined. This is equal to the heat content of the wet steam, and is also equal to the heat of the liquid plus quality times latent heat of vaporization. (As shown in a previous answer: $h = h_f + \times h_{fg}$.) The only unknown in the equation will be that of the quality, which can be determined. A throttling calorimeter is used when steam is of high quality. It is not suitable for use in determining steam quality of less than about 95 percent nor where the enthalpy of the steam is less than approximately 1150 Btu per lb.

Q: How does a separating calorimeter work? When is it used in preference to a throttling calorimeter?

A: A separating calorimeter operates as follows: Steam is taken from the main through a sampling tube and is passed through the calorimeter in which its moisture is removed and weighed. The dry steam then passes out through an orifice which has been previously calibrated in pounds against readings of an attached gage. To use the calorimeter, the gage is used to obtain the pounds of dry steam which have passed through the meter. The weight of moisture removed is also determined. Then, quality $= x =$ weight of dry steam/(weight of dry steam + weight of moisture). A separating calorimeter is used when the steam is comparatively wet.

Q: How does moisture become entrained in steam vapor?

A: Moisture may have been carried over from water in a boiler because of priming or foaming, poor design of the boiler, or forcing the boiler, or it may be due to condensation and formation of water particles in the steam due to loss of heat in piping or equipment.

Q: What is the maximum amount of heat available in a pound of dry saturated steam?

A: The maximum is 1204.1 Btu at 400 to 450 psia. Below and above these pressures, the total heat is less.

Q: How could a pound of dry saturated steam be made to contain more heat?

A: By superheating it.

Q: What is superheat?

A: When the temperature of a gas exceeds the saturation temperature at the existing pressure, it is said to be superheated. Superheat is the difference by which the actual temperature exceeds the saturation temperature. For example, steam at 250 psia has a temperature of 480 F. Since the temperature of dry saturated steam at 250 psia is 401 F, steam at this pressure but with temperature of 480 F has 79 degrees of superheat.

Q: Is the addition of heat the only way to superheat steam?

A: No. Steam can be superheated by reduction of pressure by throttling. For example, steam at 300 psia and 98 percent quality has enthalpy of $393.8 + 0.98 \times 809.0 = 1186.6$ Btu per lb. If this steam is throttled to 40 psia, it would have 16.9 Btu per lb more than dry saturated steam at that pressure (enthalpy — 1169.7; temperature — 267.2 F). The temperature of the throttled steam would be 300 F and have 32.8 degrees of superheat.

Q: What is the advantage of using superheated steam in power generating equipment?

A: The greatest possible efficiency attainable was shown by Carnot to be: Eff $= (T - T_o/T,)$ or $1 - T_o/T$; where T is the absolute temperature of the heat supply and T_o its exit temperature. It can be seen that efficiency increases as the difference between supply and exit temperature increase, or as the ratio between exit and supply temperature decreases. One way then to increase the theoretical efficiency is to raise the supply temperature as high as possible by use of superheat. (Another is to reduce the exit temperature by condensing the steam at the lowest possible pressure.)

What is a desuperheater? Why is it used?

Q: What are some of the other advantages of using superheated steam?

A: Reduction in emission of heat from piping and equipment because of the lower rate of heat transfer from superheated steam to metal surfaces than from wet steam; reduction or elimination of losses in mains, steam engines, and turbines due to condensation; reduction or elimination of damage to equipment such as turbine blades and pipe bends due to impingement of moisture; need for traps is usually eliminated.

Q: Why is the heat transfer rate from superheated steam to metal surfaces less than from wet steam to metal?

A: With superheated steam, the transfer is from dry gas to dry metal; with wet steam the transfer is from wet vapor to a wet film and then by conduction to the metal. Also, a superheated steam loses heat only when its temperature is reduced and the loss may be only a few Btu per lb in sensible heat; wet steam loses almost 1000 Btu per lb condensed, and the temperature remains the same if the pressure is constant. The volume of wet steam is reduced very substantially when it is condensed, and additional steam with additional heat immediately takes its place. Although the *temperature* difference between superheated steam and its surroundings may be higher than for wet steam, the *heat flow* from the superheated steam may be much less.

Q: What are some of the disadvantages of using superheated steam?

A: Superheated steam contains less heat per cubic foot than dry saturated steam at the same pressure. For example, at 100 psia, steam superheated to 400 F has an enthalpy of 1226.9 Btu per lb and occupies 4.934 cu ft, or 248.6 Btu per cu ft; dry saturated steam at that pressure has an enthalpy of 1186.6 Btu per lb and occupies 4.426 cu ft, or 267.9 Btu per cu ft — 7.76 percent more heat per cubic foot. For this reason, mains to carry the same amount of heat at the same pressure may have to be larger for superheated steam than for dry saturated steam.

When superheated steam is used for process work, the only heat available for transfer, as the steam cools to saturation temperature, is sensible heat. Thus, superheated steam at 400 F and 100 psia would give up only 40.3 Btu per lb in sensible heat when cooled to the dry saturation temperature. The latent heat which could be extracted as the steam condenses at that pressure is 888.2 Btu per lb.

Q: If this is so, why is steam which is to be used only for process work sometimes superheated?

A: The process may require the higher temperature, yet an increase in pressure to reach that temperature by use of dry saturated steam may not be desirable or feasible; superheat may be used to minimize or eliminate condensation losses in the mains; installation of a superheater can provide greater capacity in an existing plant at moderate cost, eliminating the necessity for installation of an additional boiler.

Q: A steam main having a cross-sectional area of 0.335 sq ft carries 36,000 lb of steam per hr from a boiler operating at 240 psia. What is the velocity of the steam in feet per minute if it is: (a) dry saturated; (b) superheated to 500 F?

A: (a) From steam tables: One lb of steam at 240 psia occupies 1.9156 cu ft. Velocity = (36,000/60) (1.9156/0.335) = 3420 fpm. (b) One lb of steam at 240 psia and 500 F occupies 2.244 cu ft. Velocity = (36,000/60) (2.244)/0.335 = 4019 fpm.

Q: What is a desuperheater? Why is it used?

A: A desuperheater reduces superheated steam to a dry saturated or wet condition by the addition of moisture. Steam from one source might be required for two different purposes. In one the use of superheat might be advantageous, but in the other it might be undesirable. For example, where steam is required for both power generation and process work, superheated steam may be passed through a turbine, and then, if it is still superheated, through a desuperheater to condition it for use in process work.

Q: When boilers are utilized only for space heating purposes, why is it sometimes advisable to operate them at the lowest pressure possible?

A: Operations at pressures higher than necessary to supply the heating load may result in additional loss of steam through defective traps and fittings, in higher heat losses to the outside air, and in reduced heat absorption through the water heating surfaces of the boiler. Also, there is more latent heat available in 1 lb of steam at low pressure than at high pressures. Since this latent heat does the major share of the space heating, fewer pounds of steam are necessary to supply the required amount of heat. Use of low pressures can minimize or eliminate the need for pressure reducing equipment.

How can the size of an accumulator be determined?

Q: Are there any limitations to this procedure of using the lowest pressure possible?

A: As pressure decreases, a pound of steam occupies greater volume. Therefore the pressure can be reduced satisfactorily only to the point where the mains will carry the required weight of steam.

Q: Couldn't the mains be designed for installation so that the lowest possible pressure could be used?

A: This may be uneconomical, as the cost of the main increases with its size. Designers must therefore strike a balance between first cost and operational savings.

Q: Why would heat absorption through boiler surfaces be reduced by operating at higher pressures?

A: The rate of heat absorption increases with an increase in the difference in temperature of the gases doing the heating and the water being heated. For example, the temperature of saturated water and steam at 100 psia is 327.8 F; at 25 psia, 237.8 F. If the gas temperature is 400 F, the difference between the gas and the water is 72.2 F at 100 psia and 162.2 F at 25 psia. Although the differences in absorption are not in direct arithmetical ratio to the differences in temperature, more heat would be absorbed at 25 psia. Conversely, for the same absorption rate, the gas temperature for a high pressure boiler would have to be higher than that for the low pressure system, resulting in higher flue gas temperatures and possibly greater loss of heat unless economizing devices are used.

Q: Does the presence of air reduce the operating efficiency of a steam system?

A: Air will act as insulation to prevent steam and heat from reaching surfaces to which heat should be transmitted. Also, it may prevent the passage of steam in lines. When air is present in a mixture with steam, the pressure and temperature of the steam itself are reduced.

Q: How can the presence of air in a mixture with steam reduce the steam pressure and temperature?

A: When two or more gases exist in a closed container, the total pressure the mixture exerts on the walls will be equal to the sum of the pressures exerted by each gas. This is known as Dalton's Law. Thus, if the total pressure in a container (assuming dry conditions) is 55 psia but air present exerts an individual pressure of 10 psi, then the steam pressure is 45 psia. The temperature of the mixture will then be the temperature of the steam at 45 psia, which is 274.4 F — not that at 55 psia, which is or 287.1 F.

Q: Why does condensate sometimes flash into steam?

A: Condensate released to a lower pressure may contain heat sufficient to provide the latent heat of vaporization necessary to cause some of the liquid to change phase to steam. For example, the heat of condensate at 60 psia is 262.0 Btu per lb while that at atmospheric pressure is 180.0 Btu per lb. Since the latent heat of vaporization at atmospheric pressure is 970.3 Btu per lb, the available heat will cause each pound of condensate to flash into 82/970.3 lb of steam.

Q: Flash steam from a tank receiving condensate from a line carrying steam at 300 psia will be used to heat a building. The pressure of the heating system will be 20 psia. How many pounds of flash steam will be available from each 100 lb of condensate?

A: Heat of liquid at 300 psia = 393.8 Btu per lb; heat of liquid at 20 psia = 196.2 Btu per lb; latent heat of vaporization at 20 psia = 960.1 Btu per lb. Therefore the amount of flash steam/100 lb of condensate = 100 (393.8 − 196.2)/960.1 = 20.6 lb.

Q: What is a steam accumulator?

A: A steam accumulator is a tank in which heat is stored by saturating a large quantity of water from which steam is released by flashing at a lower pressure when required. The accumulator stores heat produced during periods of low demand and discharges during periods of great demand. This permits boilers to operate at higher rating and efficiency during periods of low demand, and sometimes eliminates the need for additional boilers or capacity during periods of peak load. A steam accumulator can be used to great advantage for process or heating work in plants with fluctuating loads or demands.

Q: How can the required size of an accumulator be determined?

A: Accumulator size can be approximated by the same method shown above to calculate the amount of flash steam generated by condensate released to a lower pressure. However, because an appreciable amount of time may be required to obtain *all* the heat possible from the water stored in an accumulator, the quantity of water and pressure must be adjusted to provide the rate of discharge desired.

What is "apparent rate of evaporation"?

Q: What causes fluctuations in steam pressure at the boiler?

A: Pressure drops when steam is carried away more rapidly than it is produced, and increases when heat is added in a greater quantity than can be removed.

Q: What could be some of the reasons why adequate pressure cannot be maintained on a boiler?

A: Load in excess of boiler capacity; inadequate firing rate or poor combustion conditions; insufficient draft; soot-clogged boiler passages and/or breeching; inadequate air supply; dirty boiler, including scale on waterside, soot on fire side, or both; broken or leaking mains which permit excessive loss of steam; uninsulated or wet mains with high heat loss; oil or grease in boiler water.

Q: How do you compute the efficiency of a steam boiler?

A: Any efficiency can be calculated by dividing output by input (in the same units) and multiplying by 100. For a steam boiler this would be:

Efficiency, percent = (heat output × 100)/heat input = $[W_s\,(h_s - h_1) \times 100]/[W_f \times h_c]$

where:

W_s = weight of steam
W_f = units of fuel
h_c = heat content of each unit of fuel
h_s = enthalpy per pound of steam
h_1 = enthalpy of each pound of feedwater.

As an example, a boiler produces 12,000 lb of steam per hr at 160 psia and 400 F and uses 110 gal of fuel oil having a heat content of 146,000 Btu per gal. Feedwater temperature is 200 F. From the steam tables, the enthalpy per pound of steam and feedwater are 1218 and 168.1 Btu per lb, respectively.

$$\text{Efficiency} = [12{,}000\ (1218.0 - 168.1)]/[110 \times 146{,}000] \times 100 = 78.4 \text{ percent}$$

Q: A plant does not have a steam calorimeter. Can the efficiency of the plant be determined?

A: Yes, if the steam is superheated, as shown in the example above. If it is not, the quality of the steam might be estimated or, for a rough determination, the quality could be assumed as 100 percent. The same method indicated above could then be used.

Q: What is "apparent rate of evaporation"? When is it used?

A: Apparent rate of evaporation is the number of pounds of water evaporated divided by the number of units of fuel burned during the same period. For example, a coal burning boiler generates 8400 lb of steam using 1000 lb of coal. The apparent rate of evaporation is 8400/1000, or 8.4 lb of steam per pound of coal. This method of comparison can be used in day to day operation of any certain boiler to indicate variances, and for rough efficiencies. It cannot be used to accurately compare different boiler plants for which operating conditions are not alike.

Q: What is a "developed horsepower"?

A: The capacity to evaporate 34.5 lb of water per hr from and at 212 F. Since the latent heat of evaporation under this condition is 970.3 Btu per lb, a developed horsepower is equivalent to 33,475 Btu per hr.

Q: What is "actual factor of evaporation"? When is it used?

A: It is the ratio of heat added to evaporate a pound of water, under actual operating conditions, to the heat of vaporization from and at 212 F. For example, a boiler uses feedwater at 172 F and produces dry steam at 100 psia. Actual factor of evaporation is used to convert different operating conditions to one standard, based on evaporation from and at 212 F.

Q: What is the actual factor of evaporation?

A: A.F.E. = (1187.2 − 172 + 32)/970.3 = 1.08.

Q: What is "equivalent evaporation"?

A: Equivalent evaporation is evaporation corrected to the standard of water evaporated from and at 212 F. It is the product of either apparent evaporation or apparent rate of evaporation and actual factor of evaporation. For example, the apparent rate of evaporation of a boiler producing 8400 lb of steam per hr is 8.4 lb of steam per lb of coal, and the actual factor of evaporation is 1.08. What is the equivalent evaporation in total pounds of steam and in pounds of steam per pound of coal? Equivalent evaporation = 1.08 × 8400 = 9072 lb of steam per hr; or 1.08 × 8.4 = 9.07 lb of steam per lb of coal. Equivalent evaporation in pounds of steam evaporated or in pounds of steam per pound of fuel can be used to compare boilers operating under different conditions. When equivalent evaporation in pounds of steam is divided by 34.5, the result is the number of developed horsepower. Thus, a boiler producing steam equivalent in enthalpy to the evaporation of 9072 lb of steam from and at 212 F has a developed horsepower of 9072/34.5, or 262.9. ‡

the law and your profits

JOHN F. MORRISSEY, author of this regular feature, is an attorney at law and has an extensive practical business and legal background. This series is based on actual cases. All names are, however, fictitious. It should, of course, be remembered that the law varies in different states.

Contract Wording Should Agree with Intent

Again and again individuals and companies enter into contracts without certainty as to the meaning of words or terms contained therein. A great deal of caution should be exercised in adding words to a printed and properly drawn contract, as will be seen in the following case.

Interline Air Conditioning Co. contracted in writing with the Breeze-By Hotel to install a complete air conditioning system in the hotel for $20,000.

The system was installed, but Interline received only the initial partial payment of $5000. When the balance was not received after a reasonable length of time, Interline filed legal proceedings to enforce its alleged mechanic's lien against the hotel property.

Breeze-By Hotel defended against the proceedings by alleging (1) that Underline had failed to install a satisfactory air conditioning system, and (2) that the written contract between the parties provided that the work done would be "free from mechanics' liens."

The court examined both Interline's and Breeze-By's copies of the contract and found that it was a printed form and that, between some printed words, the words "free from mechanics' liens" were written in ink.

Interline admitted that the words had been written in prior to the signing of the contract. Without going into any question regarding the adequacy of the system installation, the court ruled that Interline had no lien and the proceedings were dismissed.

Interline appealed the case to a higher court and argued that the ink written words of the contract had no reference to its own lien but applied only to any subcontractor's work or material.

"Obviously," said Interline, "we only intended to protect Breeze-By against subcontractors' liens. We certainly did not imply to exclude *our* right to a lien."

The higher court referred to a statutory provision then in effect which provided in part that, "if the legal effect of any contract between the owner and contractor is that no lien or claim may be filed or maintained by anyone, such provision shall be binding."

"Words must be construed in their ordinary meanings," said the higher court. "We believe the written words in question are universal in their exclusion. They exclude not only subcontractors but the original contractor. They are equivalent to a promise that there shall be no mechanic's lien, either in favor of the original contractor or subcontractor."

The court held that, owing to the terms of the contract, as a matter of law Interline was not entitled to a mechanic's lien.

This case did not conclude that Interline had no right to collect from Breeze-By—only that it had no lien against the property and, therefore, a proceeding brought to enforce the lien could not be sustained.

Interline could still attempt to collect by an appropriate lawsuit upon the debt. However, the property did not now stand as security and Interline's ability to collect may have been seriously impaired in the event that other valid liens upon the property existed.

Interline had been involved in an expensive legal procedure and received nothing in return. ‡

Nomograph Converts Standard Cfm to Actual Cfm For Varying Gas Temperatures, Pressures

BY F. CAPLAN
Design Engineer
Kaiser Engineers
Div. of Henry J. Kaiser Co.

DRYERS, compressors, and other gas equipment are usually rated in terms of standard cubic feet per minute (scfm), i.e., at 14.7 psia and 70 F. Conversion is necessary in order to determine the actual cubic feet per minute (acfm) which can be delivered by the equipment or what the rating is if the performance can be measured. This is accomplished by using the gas laws:

$$P_sV_s/T_s = P_aV_a/T_a \quad \ldots\ldots [1]$$

where:

P_s = 14.7 psia
V_s = standard volume, cu ft = scf
T_a = actual temperature, R (= 460 + F)
T_s = 70 F = 530
P_a = actual gas pressure, psia
V_a = actual volume, cu ft = acf.

Equation 1 then becomes:

$$\text{scf} = \text{acf}\ (P_a/14.7)\ (530/T_a) \quad \ldots\ldots [2]$$

The nomograph on the next page is a graphical solution of Equation 2. For values beyond the scales, note that if either the P or acf scale value is multiplied by N, then the scale value of scf must be multiplied by N.

Example 1:

What is the scfm corresponding to 210,000 acfm at 696 psia and 1430 F?

Solution: Align t = 1430 with (1000) 210 and continue to α; align α with P = (10) 69.6 and read scfm = (1000) (10) 278 = 2,780,000.

Example 2:

A compressor has a rated capacity of 150 scfm. To what acfm does this correspond, for air at 300 psia and 110 F?

Solution: Align P = 300 = 30 (10) with scf = 150 and continue to pivot line α, align α with t = 110 F and read acf = 79; since P was multiplied by 10, acf must be divided by 10. The answer is acfm = (0.1) 79 = 7.9.

Example 3:

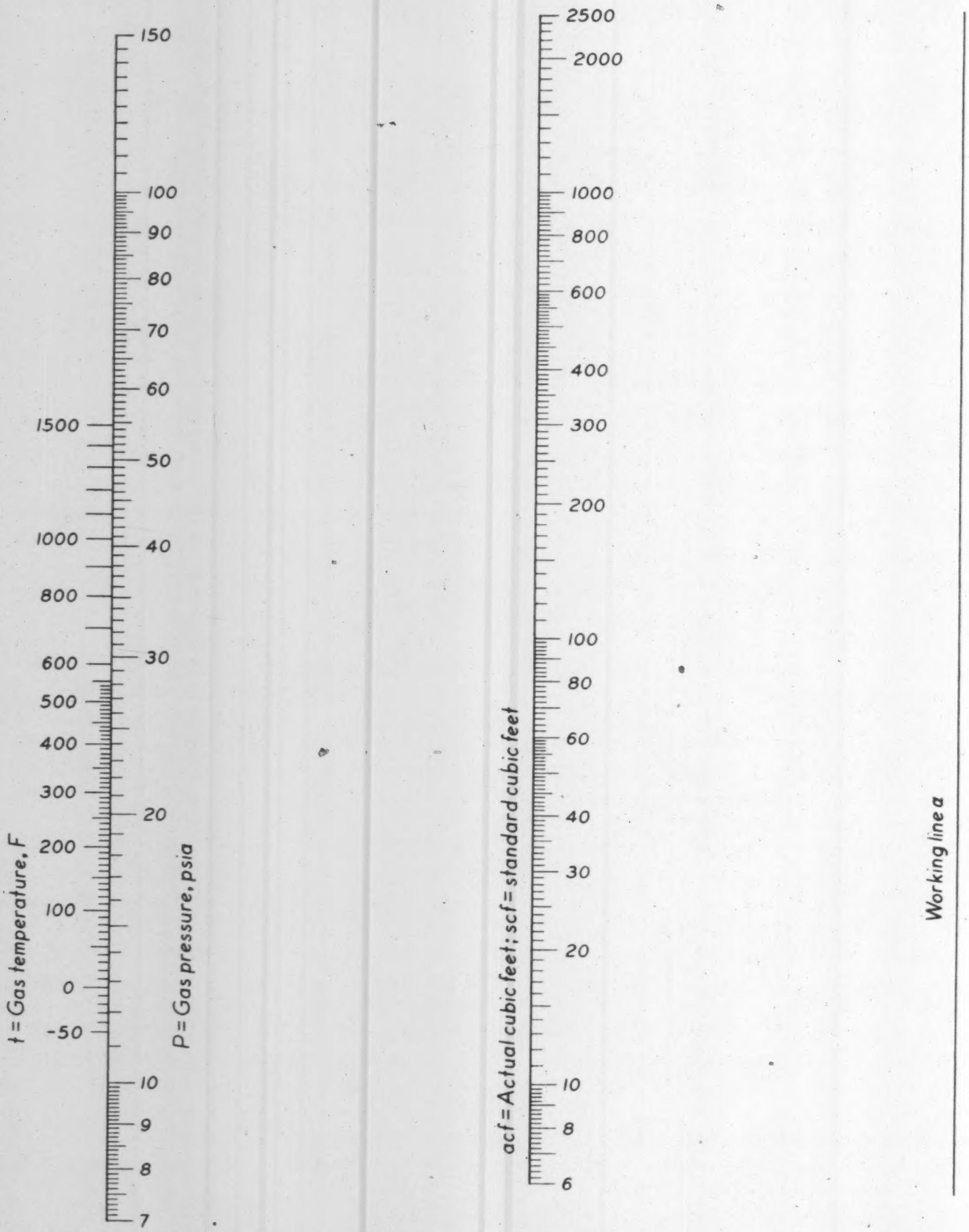
Air at one atmosphere pressure and 70 F is admitted into a tank. The tank is heated to 500 F. What is the pressure in the tank?

Solution: On the first scale at the nomograph, opposite t = 500 F, read the answer, P = 26.7 psia.

Example 4:

Air, at zero F, flows through a duct at 100 fpm, then through a heater where the temperature is raised to 600 F, and then into a duct of the same cross-sectional area. If the pressure is the same in both ducts, what is the air velocity in the duct following the heater?

Solution: For constant pressure flow in a constant area duct, velocity is proportional to gas volume. This in turn is proportional to the absolute temperature. Therefore, let the middle scale represent the velocities and align t_1 = zero F with acf = 100 and continue to α. Align α with t_2 = 600 F and read acf = 230 = final velocity, fpm.



NOMOGRAPH quickly converts standard cubic feet per minute of gas to actual cubic feet per minute of gas that can be delivered to equipment under varying temperature, pressure conditions. How to use it is explained on preceding page

New Design Tool Permits Quick, Accurate Selection of Dehumidifying Cooling Coils

. . . for chilled water and direct expansion systems

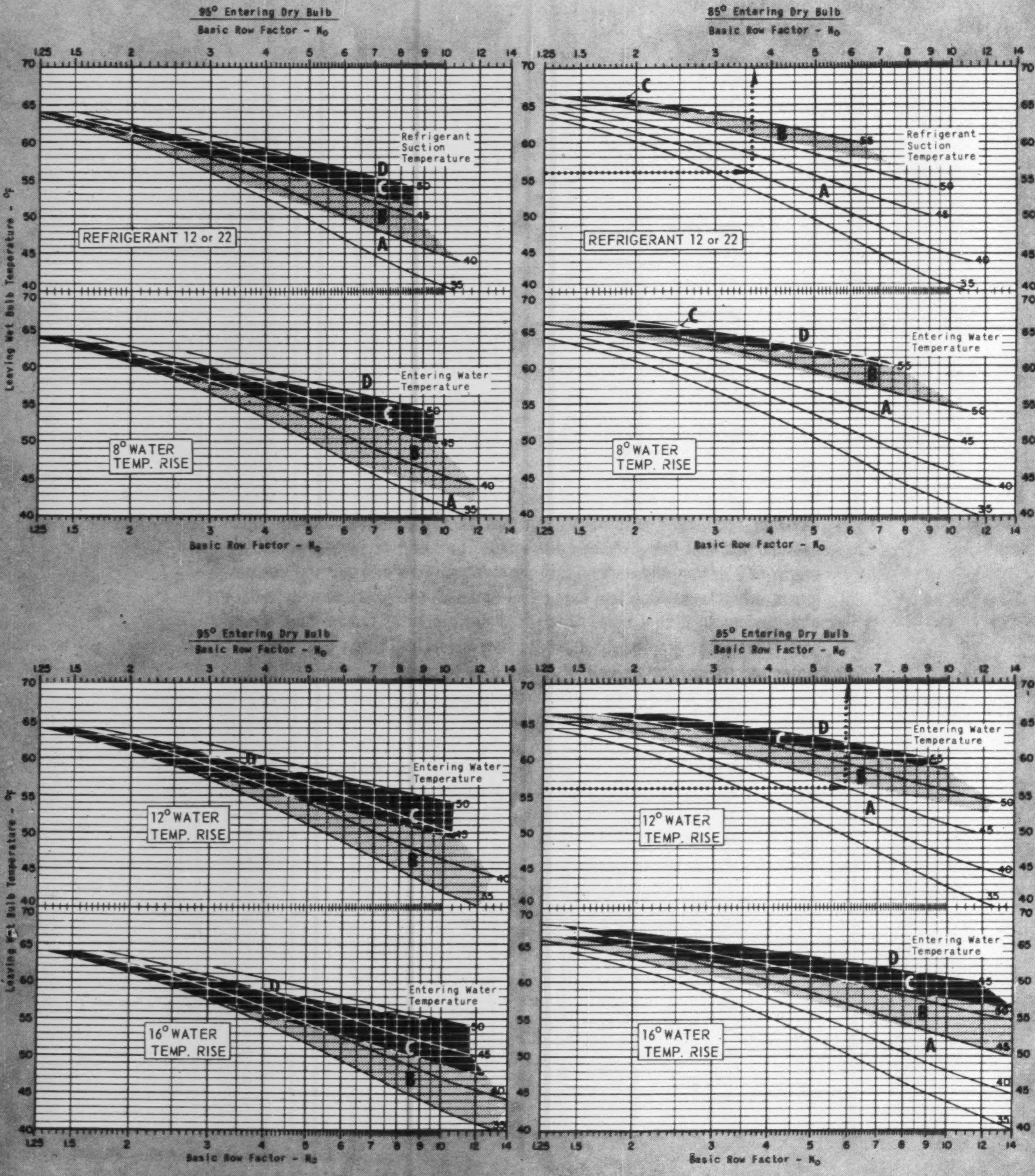
• Fast, yet highly accurate selections of dehumidifying coils for either water or refrigerant applications can now be made through the use of a new method that has just been developed. The result of several years' research and testing, the method incorporates both new and existing theories into a valuable working tool that offers optimum coil selection at considerable savings in design time. Herein is a description of the method, along with charts that graphically illustrate how actual selections are made for water and refrigerant systems.

Mr. Ernst earned his mechanical engineering degree at Marquette University. After serving in the Navy as a damage control officer aboard an aircraft carrier during World War II, he joined Trane Co. in 1946 as a member of the company's student training class for graduate engineers. He was assigned to the coil sales department and, in 1953, became its manager. Mr. Ernst is a past president of the Heating and Cooling Coil Manufacturers Association.

BY T. W. ERNST
Manager, Coil Dept.
The Trane Co.

A VERY ACCURATE, yet quick method of selecting either water or refrigerant cooling coils for dehumidifying applications has been developed. Believed to be even more accurate than present methods, it will save considerable time in selecting coils for a wide range of comfort cooling and dehumidifying conditions.

The method is based on new theories that have been developed and combined with existing theories to secure a high degree of accuracy. The correlations which have been established from these new theories have been substantiated by several years of research and tests.



1 THIS BASIC ROW FACTOR CHART for water or refrigerant dehumidifying and cooling requires only application of a simple correction factor to complete coil selection. Curves are based on entering air at 70 F WB

New method is highly accurate for two reasons

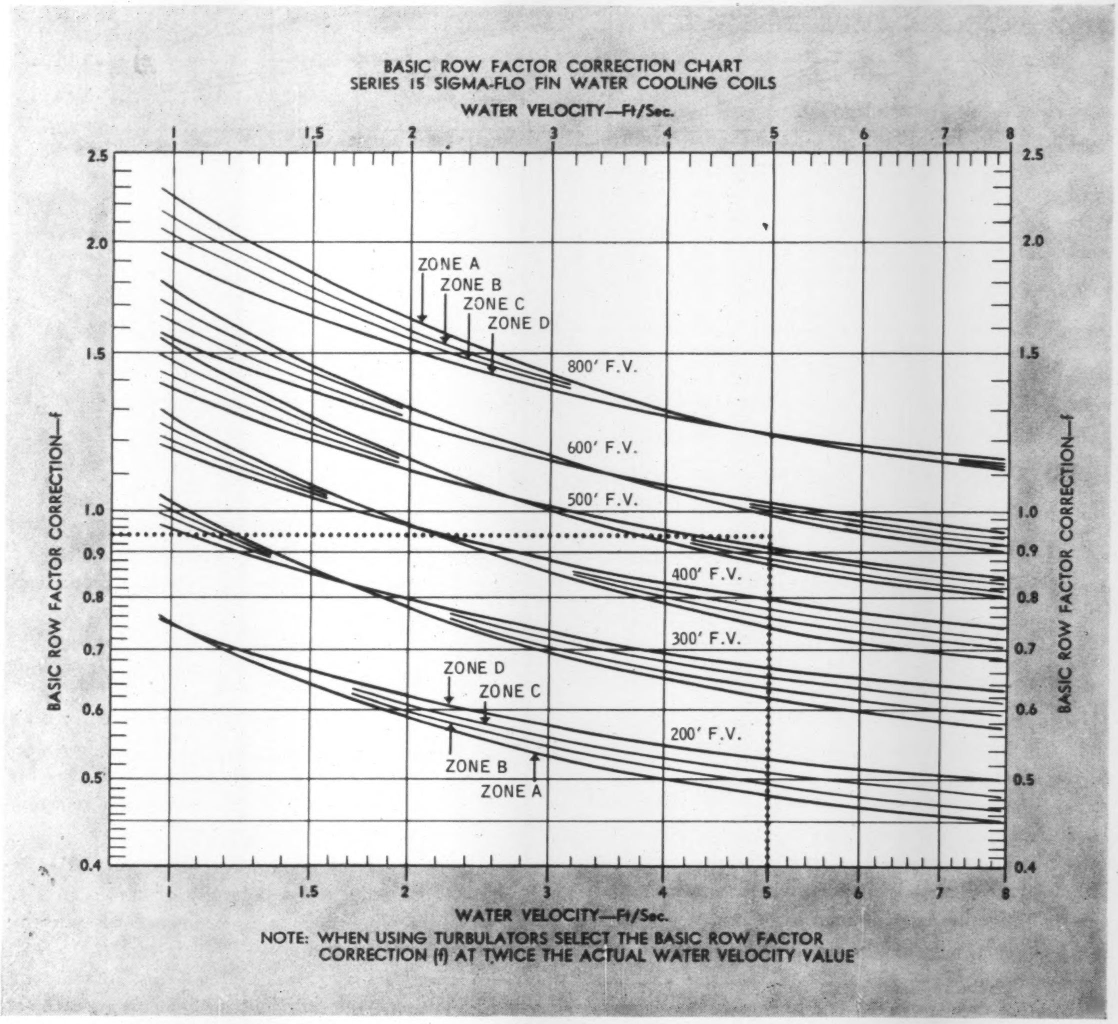
The high degree of accuracy is possible because:

1) The effect of moisture condensing out of the air on the fin surfaces has been taken into consideration, as well as the effect of the fin size, shape, and thickness.

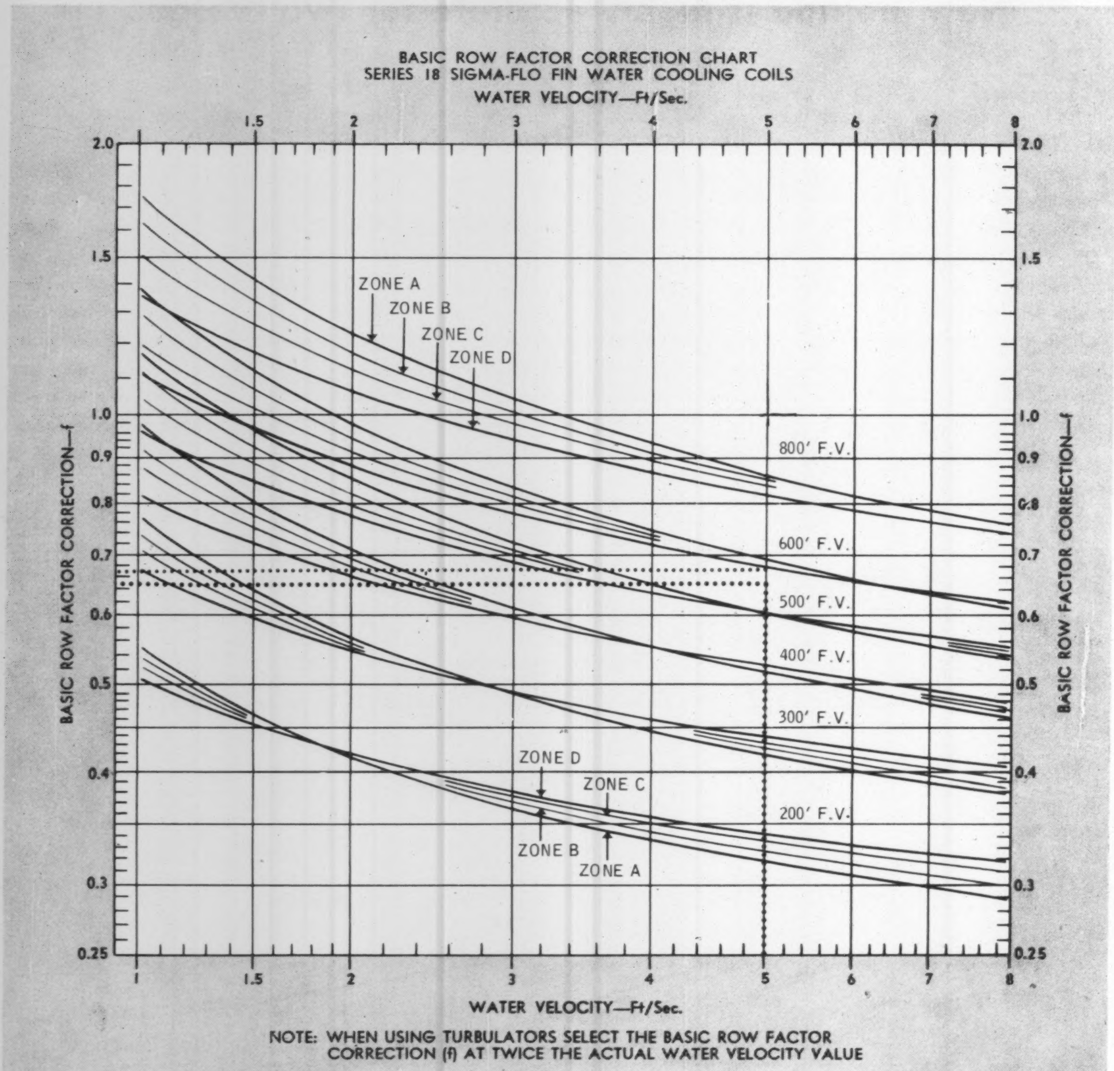
2) The method employs the true heat transfer driving force for wet and dry (if any) portions of dehumidifying coils. Dry bulb temperatures and a sensible heat transfer coefficient determine the dry surface required; wet bulb temperatures and the proper combined sensible and latent transfer coefficient determine the wetted surface.

Present methods for selecting dehumidifying coils use a sensible heat transfer coefficient based on the entering and leaving dry bulb air temperatures, which is supposedly corrected for the dehumidifying conditions by employing a "wetted surface" factor, or a factor based on the ratio of the sensible heat to the total heat.

These factors, however, introduce inaccuracies because their relationship applies only to a rather narrow range of dehumidifying conditions. Other published methods that have attempted to broaden the range of application, and maintain accuracy, have been too cumbersome to use for routine coil selections.



2 WATER COIL CORRECTION FACTOR for each fin series is dependent on coil air velocity and water velocity inside coil tubes. This information is plotted for Series 15 (15 fins per unit length) coils



3 THIS ROW FACTOR CORRECTION chart plots Series 18 water coils. These curves quickly determine proper correction factor

Using the new theory, a rapid method for selecting coils has been developed using charts and a single correction factor.

The charts and correction factors were prepared from data that was computed electronically over the entire range of comfort dehumidifying conditions. The use of electronic computing equipment eliminated the possibility of human error and retained the inherent accuracy of the basic rating theory and correlations.

Fig. 1 is an example of one of the curves required for making the basic "row factor" determination. Each chart plots the various conditions required for making a coil selection for two entering air dry bulb temperatures and one entering air wet bulb temperature. Each curve represents the basic row factors for varying leaving wet bulb temperatures at a constant entering water temperature and rise.

In the case of refrigerant No. 12 or No. 22 coils, represented by the topmost family of curves in Fig. 1, suction temperature is used instead of entering water temperature and rise.

Referring to Fig. 1, for each entering air temperature condition, there are four sets of curves, each set consisting of up to five entering water temperature or refrigerant suction temperature curves.

Each set of curves, beginning with the water temperature rise of 8 F, is for a constant water temperature rise. The first set, however, applies to refrigerant cooling coils. Zones identified as *A*, *B*, *C*, or *D* indicate the degree of dehumidification. The zone where the "row factor" is selected must be considered when applying the correction factor.

The vertical scale in Fig. 1 represents the desired leaving wet bulb temperature. The horizontal scale indicates the basic "row factor." To this latter number, a correction factor (Fig. 2) must be applied, depending upon the coil air face velocity and water velocity in the case of water cooling coils, and air face velocity and refrigerant circuit loading in the case of refrigerant No. 12 or No. 22 coils.

Zone *A*, *B*, *C*, or *D*, determined from the row factor chart, also must be considered in determining the correction factor. By taking into consideration the effect of dehumidification, the accuracy of the original basic theory and correlations is thus retained.

How to Choose Water Coils

With this explanation of the basic selection chart, let's follow through a selection of a typical dehumidifying water cooling coil. Assume that the problem is to cool 12,450 standard cfm of air from 85 F DB and 70 F WB down to 56 F WB. Also assume that 96 gpm of 45 F chilled water is available.

It is desirable in this problem to limit the air face velocity to a maximum of 575 fpm.

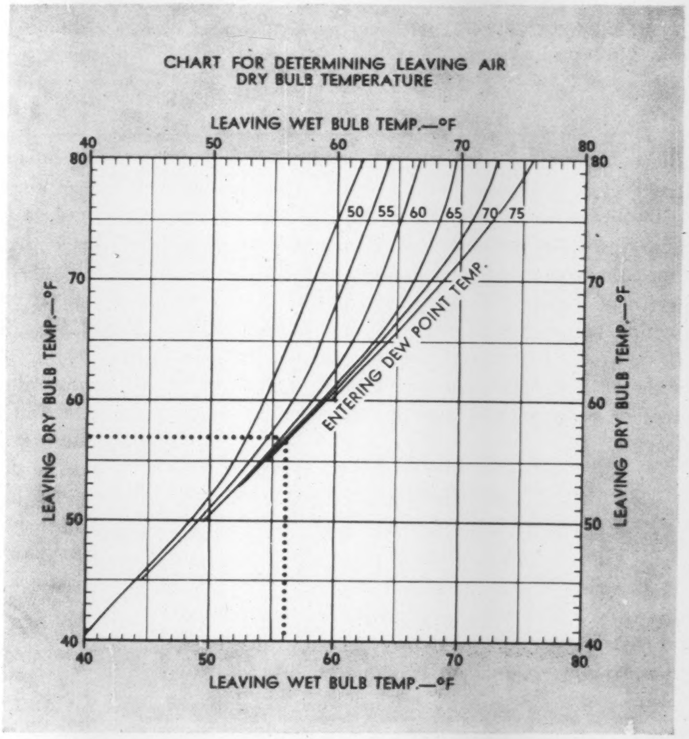
From established methods, it can be determined that the total cooling coil load for the given conditions is 574,255 Btu per hr. Knowing the flow rate and the total cooling coil load, a water temperature rise of 12 F is calculated. To stay within the face velocity limits specified, a coil having a face dimension of 33 in. × 96 in. will be used. The standard air face velocity is 565 fpm.

From available literature, the water velocity inside the coil tubes can be determined as being 5 fps for the coil size selected.

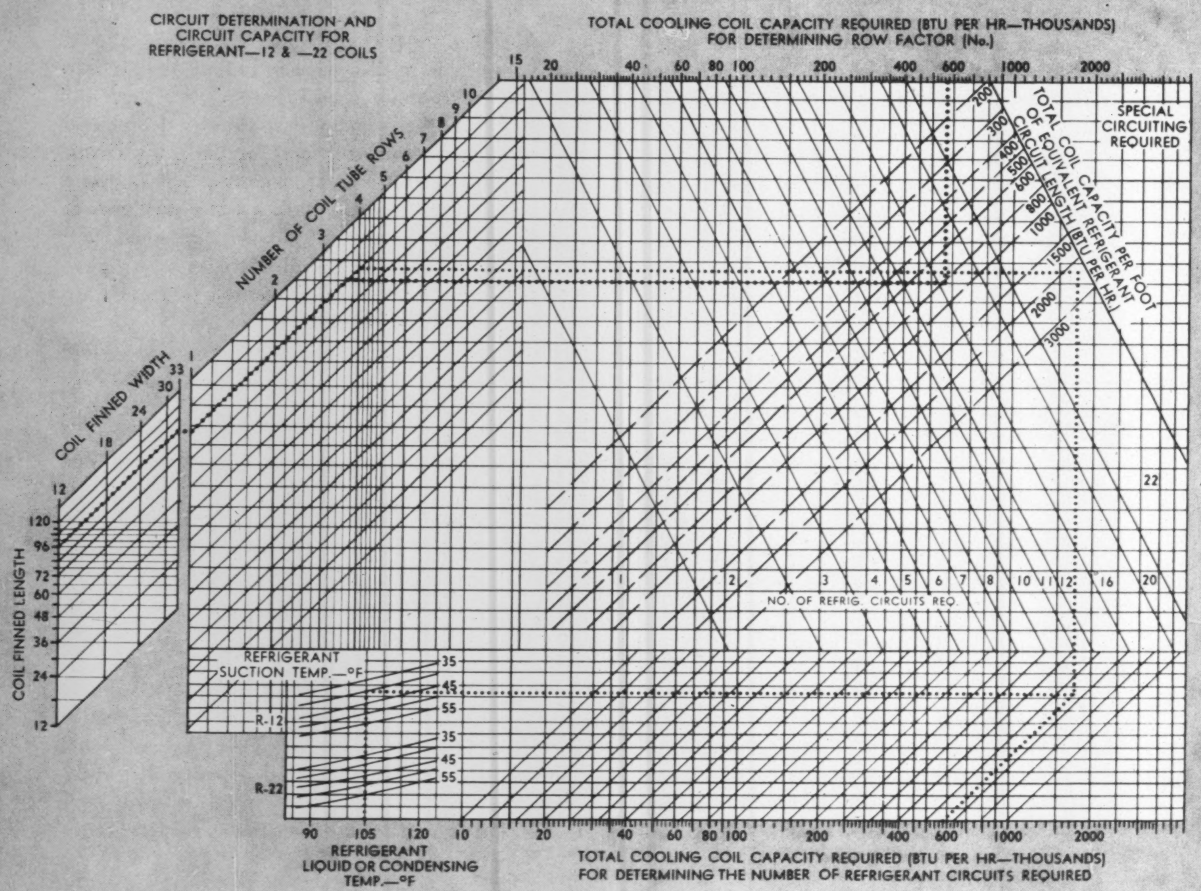
With this information determined, the number of rows of coil tubes in the direction of air flow can be selected from the proper selection chart and correction factor. For our example, Fig. 1 again illustrates the chart for the entering air conditions given:

1) Refer to Fig. 1. At a water temperature rise of 12 F and an entering water temperature of 45 F, the basic row factor necessary to secure a leaving wet bulb temperature of 56 F is 5.95 (Zone *A*). Noting the zone in the chart where the selection falls (in this case Zone *A*), the row factor of 5.95 must be corrected for the zone, face velocity, and water velocity. This is done with a single correction multiplying factor.

2) Figs. 2 and 3 illustrate the correction factor



4 KNOWING ENTERING AIR DEWPOINT temperature and leaving air wet bulb temperature, leaving air dry bulb temperature can be quickly and accurately determined from this chart



5 REFRIGERANT LOADING and required number of tube circuits for refrigerant No. 12 or No. 22 coils is graphically determined using this chart

charts. Each family of curves represents a different face velocity for the various zones. The horizontal scale represents the water velocity. For this example, at 5 fps water velocity and a face velocity of 565 fpm, the correction factor for a coil having a fin series of 15 is 0.94, as shown in Fig. 2. The correction factor for a Series 18* coil from Fig. 3 is 0.65. In the case of refrigerant coils, the horizontal scale on the correction factor chart represents the cooling capacity per foot of equivalent refrigerant circuit.

3) The number of rows needed for this example is:

For a Series 15 coil: 5.95 × 0.94 = 5.59 rows
For a Series 18 coil: 5.95 × 0.65 = 3.87 rows

In this case, then, select a 33 in. × 96 in., four-row, Series 18 coil. Note that a more economical selection can be made by adjusting the coil face area to calculate an integral number of rows (four rows in this example). This can be simply done by dividing the integral number of rows by the row factor to determine the required correction factor. In this example this correction factor would be 4.0/5.95, or 0.67. From the correction factor chart for Series 18 fins (Fig. 3) at a correction factor of 0.67, the optimum coil face velocity is 580 fpm for a coil face area of 21.45 sq ft.

4) If it is desirable to know the leaving dry bulb temperature, this can be determined quite simply by referring to the chart shown in Fig. 4. Knowing the entering air dewpoint temperature (62.7 F), which can be determined from a psychrometric chart, and the leaving air wet bulb temperature, the leaving dry bulb temperature can be determined. For this particular problem, the leaving temperature from the chart is 57 F DB.

Selecting Refrigerant Coils

Selection of a refrigerant coil is similar, except that the cooling load per circuit must be determined

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**Series 15 and 18 designations indicate the number of fins per unit length.*

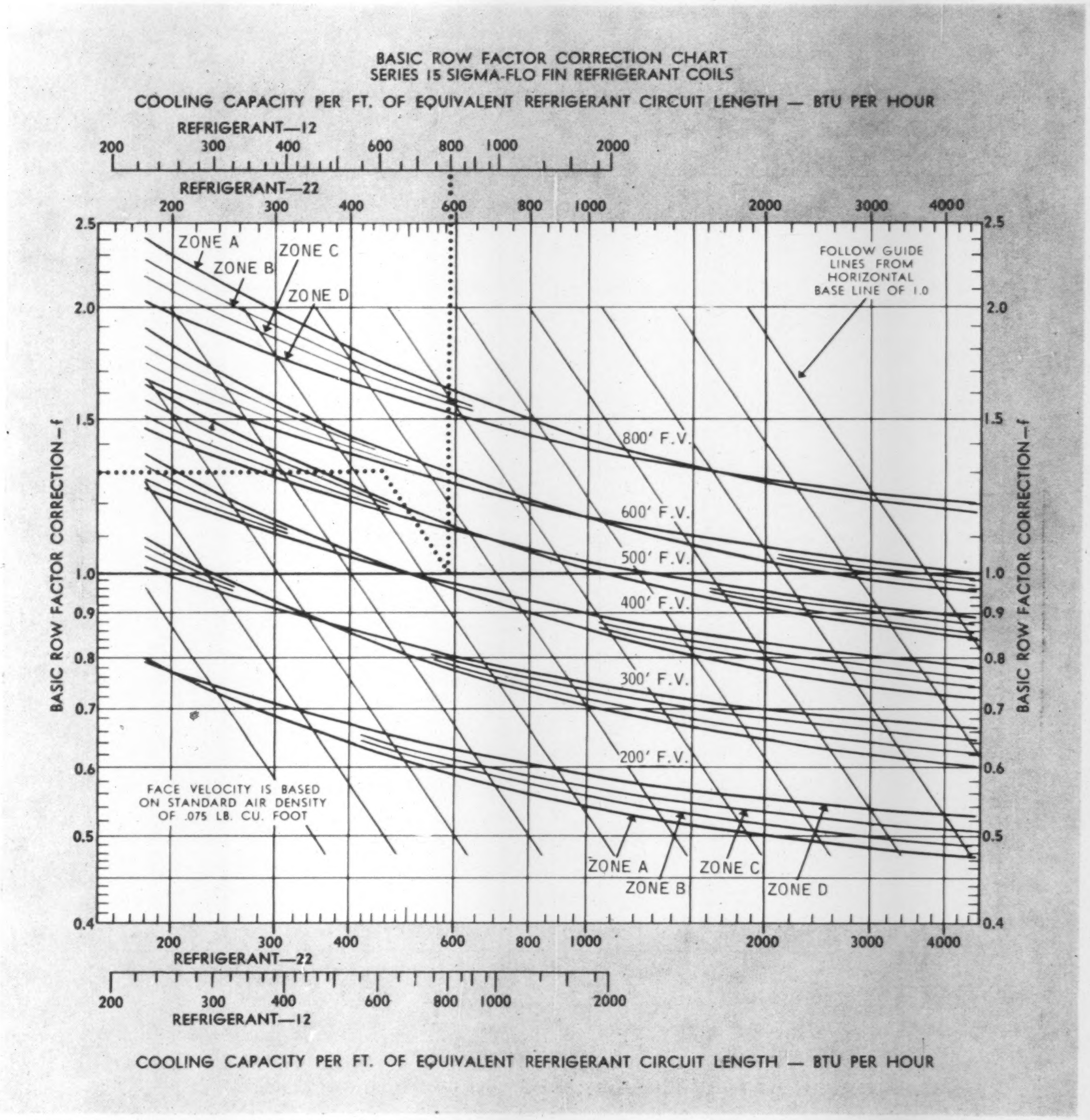
to select the proper correction factor. For a refrigerant coil selection, let's assume that the conditions are the same as for the water selection example. However, instead of chilled water, we have available refrigerant No. 12 at a suction temperature of 40 F and a liquid or condensing temperature of 105 F.

From Fig. 1:

1) The basic row factor for a refrigerant coil at a suction temperature of 40 F is 3.65 (Zone *A*).

2) Fig. 5 illustrates the refrigerant loading and circuit chart for refrigerant coils. Going into the chart at the scales on the left, and knowing the coil size and the row factor, follow the dotted line for this problem until it intersects the vertical total cooling coil load line determined from the top horizontal scale. The intersection determines the cooling capacity per foot of equivalent refrigerant circuit length at the upper right-hand diagonal scale, which is 800 for this problem.

3) With this value, the correction factors can be determined from Figs. 6 and 7 (fin Series 15 and 18, respectively). From the horizontal scale for refrigerant No. 12 on each chart, draw a vertical line from



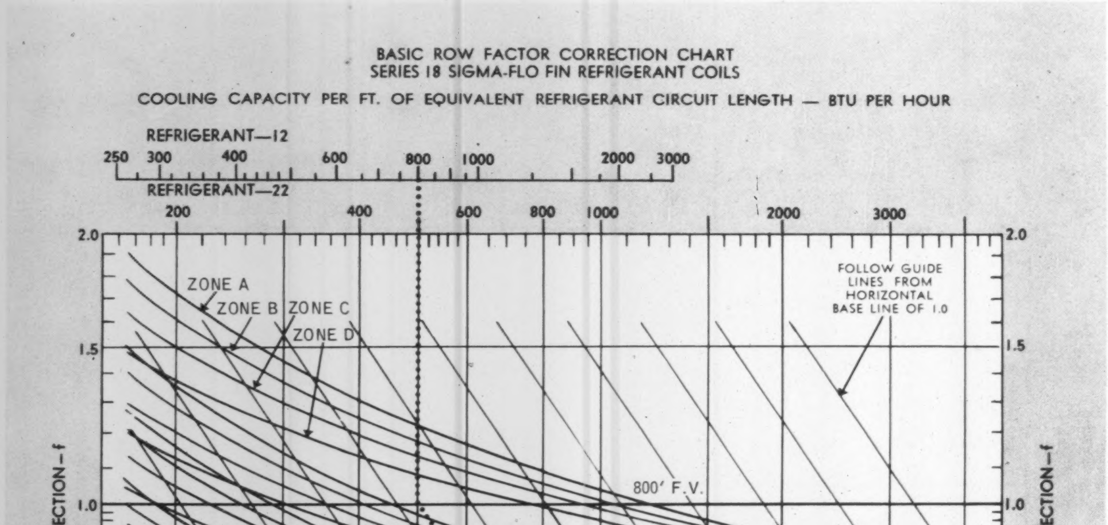
6 REFRIGERANT COIL CORRECTION FACTOR for each fin series is determined from these curves, knowing coil air velocity and cooling capacity per foot of equivalent refrigerant circuit length the 800 value. Where this line intersects the 1.0 correction factor horizontal line, follow the diagonal guide lines to the proper coil face velocity, which for this problem is 565 fpm. From this point, read the correction factor *f* from the vertical scale, which is 1.30 for a Series 15 fin coil and 0.89 for a Series 18 fin coil.

4) The correction factor multiplied by the row factor (3.65), gives the correct number of rows required for the conditions given:

Fin Series 15: 3.25 × 1.30 = 4.75 rows
Fin Series 18: 3.65 × 0.89 = 3.25 rows

Again, fin Series 18 results in the most economical coil selection, requiring an integral number of four rows.

5) The number of refrigerant circuits required for the conditions given is 22. This is also determined from the circuit chart illustrated in Fig. 5. Entering the bottom horizontal scale, the diagonal guide lines are followed from the total cooling load value until it intersects the horizontal line locating the proper refrigerant, the suction, and the condensing temperatures. From this point, a vertical line is drawn until it intersects the horizontal line determined from the



7 CORRECTION FACTOR FOR SERIES 18 refrigerant coils is determined from proper use of this chart coil size and final number of rows selected. The number of refrigerant circuits is indicated in the area where the point of intersection occurs.

Findings Can Be Interpolated

Although the example illustrated requires no interpolation, the simplicity and accuracy is still retained when interpolation is necessary.

1) The water temperature rise values for water cooling coils range from 8 F through 16 F at 4 F increments. Water temperature rises between the values shown in Fig. 1 can be interpolated if necessary. If the water temperature rise for this example were 14 F instead of 12 F, the row factor would be read at 12 F and at 16 F, and the row factor value used would be halfway between.

2) When it is necessary to interpolate (or extrapolate) the entering air dry bulb temperature, the chart illustrated in Fig. 8 can be utilized for this purpose. Using this chart, the row factor is located at any two known entering dry bulb temperatures. These two values are then connected by a straight line. The line can be extended beyond the charted dry bulb temperatures for extrapolation. The point where this line intersects the vertical line representing the desired dry bulb determines the row factor on the vertical scale. For example, if the entering dry bulb temperature were 87 F instead of 85 F, the row factor for the water cooling coil example would be 5.8 instead of 5.95.

3) When interpolating, if it is found that the selection falls in two different zones in the row factor chart and the zone letters are adjacent in the alphabet, the zone correction factor that appears higher in the alphabet should be used. If the zone letters are not adjacent, use the letter in between. For example, if the basic selection falls in Zones *B* and *C*, use Zone *C* for the correction factor. If the basic selection falls in Zones *A* and *C*, when interpolating, use Zone *B* for the correction factor.

4) To avoid interpolating for entering air wet bulb temperatures, these are charted at 1 F increments over the entire range. In the range of the entering air conditions used more frequently, the entering air wet bulb temperatures are charted in increments of 0.5 F.

Advantages Are Many

This new method for selecting dehumidifying coils offers many advantages:

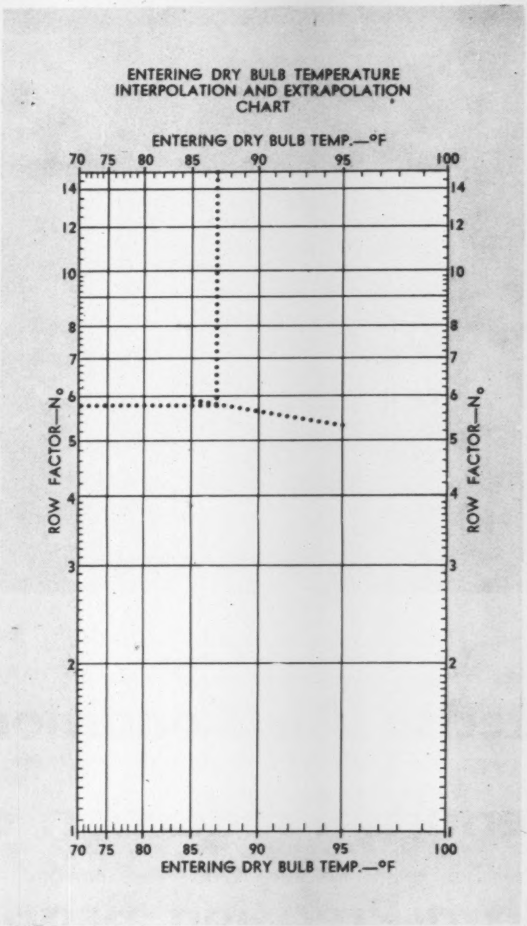
1) First and foremost, it is a fast, yet accurate method for selecting dehumidifying coils for either water or refrigerant applications.

2) After the basic row factor is established, it offers a great deal of flexibility, permitting quick, optimum coil selection by varying the coil size (coil face velocity), water velocity (cooling load per circuit in the case of refrigerant coils), and fin spacing.

3) It graphically illustrates how further optimum coil selection can be achieved by going back into the basic row factor table and varying the entering water temperature, the desired leaving wet bulb temperature, and/or the entering wet bulb and dry bulb temperatures.

4) It allows complete freedom to select the coil that best meets all of the requirements with a high degree of accuracy. It does not limit the selection to a number of fixed rows or face velocities.

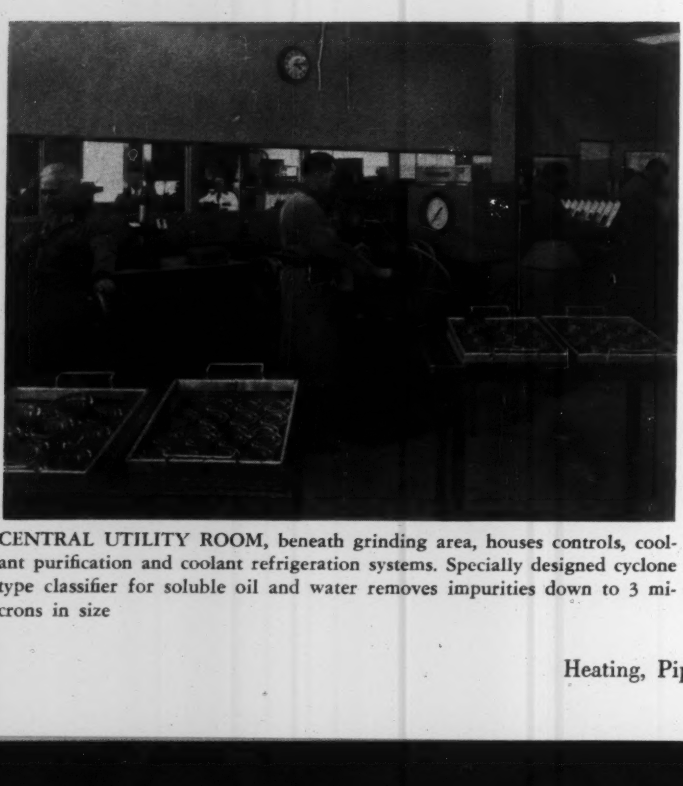
5) The method permits a reverse determination. That is, with a fixed coil size, number of rows, and fin series, the capacity that can be produced for a given water temperature and water flow, or refrigerant loading and suction temperature, can be determined.



8 WHEN INTERPOLATION (or extrapolation) between entering air dry bulb temperatures is necessary, this chart will simplify operation

ULTRA-PRECISION grinding area is fully air conditioned, with temperature held within 1 deg of 70 F, relative humidity maintained between 45 and 50 percent. Careful planning eliminated overhead coolant and power lines now located below floor

Precise Air Conditioning Permits Production of Ultra-Precision Bearings



CENTRAL UTILITY ROOM, beneath grinding area, houses controls, coolant purification and coolant refrigeration systems. Specially designed cyclone type classifier for soluble oil and water removes impurities down to 3 microns in size

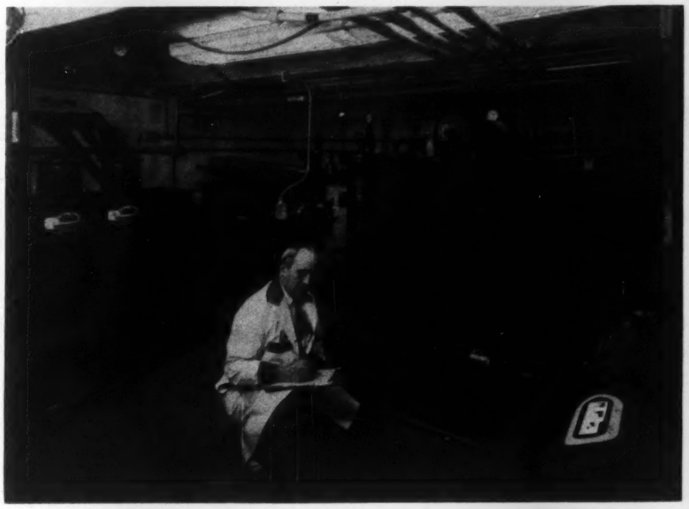
CLOSE CONTROL of temperature, relative humidity, and air cleanliness in the new Norma-Hoffman Bearings Corp. plant, Stamford, Conn., is now making possible the assembly of large precision angular contact bearings with tolerances as small as 0.00015 in.

In holding these close tolerances, it is necessary to measure and inspect the parts much more closely than the actual tolerance specified. Since inspection is needed after every machining operation, it was felt that maintaining the controlled temperature of 70 F (± 1 F) and relative humidity between 45 and 50 percent would speed up the flow of parts from one machine to another. This is possible because the parts will be at the same temperature as the gaging equipment as they come off the machine. Thus, the normal time lag that would occur when parts must cool down to ambient temperature has been eliminated.

Cooling the coolant also contributes to elimination of time lag. It not only keeps the parts cool as they are worked, but also keeps the machine itself cool. Of course, this reduces the tendency of the bearing components to expand as the temperature increases.

Because bearing parts are measured

Close control eliminates production delays, holds down costs



ASSEMBLY AREA is air conditioned and dustfree. Special automatic filter on outside air intake removes dust. Filter automatically exposes new surface to air when accumulation of dust particles on filter face blocks air flow through medium

during the machining operation, it is also important that the air temperature throughout the area be kept uniform in order to eliminate dimensional deviations. Also, constant control of the relative humidity prevents staining and corrosion of parts and minimizes the need for costly and time consuming anti-rust treatment.

As outside air is admitted into the plant, it is filtered by a continuously rotating filter blanket that is set to expose a new surface when the air flow rate is reduced by accumulated dirt particles on the filter face.

A 24 ton packaged air conditioning unit with specially adapted reheat coils for humidity control keeps the air temperature and relative humidity within the limits of 70 F (± 1 F) and 45 to 50 percent RH, respectively.

Low pressure steam from the plant's boiler is supplied to the preheat and reheat coils. In summer, the system is actually under control of the humidistat whose sensing element is located in the main duct.

Air is diffused to the grinding and assembly rooms through a duct distribution system above the hung ceiling. The system provides 10 air changes per hour. Because of the higher cooling load in the grinding room, a larger percentage of air is supplied to that room. All ducts are insulated and covered with a vapor barrier. The return air is picked up at the floor level along three sides of each area.

Switching from summer to winter operation is accomplished by throwing one switch which transfers the control from the humidistat to the winter thermostat. At the same time, the outside air supply damper is set for the minimum condition: 25 percent outside air. No additional heating equipment is necessary during the winter since the air system and heating coils have sufficient capacity.

The cooling tower operates all year 'round, with no antifreeze protection in winter. Makeup water level is controlled electronically. In order to keep the tower load constant, the condensing unit is arranged with an automatic unloading device to balance the load on the air conditioning unit against the constant flow of water in the tower.

A double damper is used on the outside air intake for maximum and minimum conditions. During winter, the outside damper closes automatically if a steam failure occurs. When the sensing element in the main duct measures an air temperature of 35 F, the damper closes and the fan and air conditioning unit are stopped.

An alarm system is also connected into the control system to sound when a drop in temperature takes place due to a failure of steam supply. Not only does the alarm sound to notify maintenance personnel; the cooling side of the system also automatically shuts down. In winter, the outside damper closes.

Coolant temperature is thermostatically and pressure controlled within 2 F of room temperature because a differential of 10 F or more between gages and parts would give a false out-of-tolerance reading. To achieve this control of the coolant temperature, a 5 hp chiller is connected into the grinding coolant system on a bypass to avoid overcooling. The grinding coolant is circulated at the rate of 50 gpm through the chiller on a demand basis controlled by a thermostat. The capacity of the coolant system is 75 gpm.

A specially designed cyclone type classifier for soluble oil and water coolant is capable of removing suspended impurities down to 3 microns. The piping system consists of galvanized iron pipe installed under the floor of the ultra-precision area. All pipe joints are threaded.

The mechanical (heating, piping, and air conditioning) contractor was Richards & Jessup. ⧺

New Formulas Aid Computer Solution Of Piping Design Stress Problems

● Modern electronic computers can perform in a matter of minutes the same calculations that used to take hours. In evaluating shape coefficients for piping systems, they can cut days of tedious manual computation from valuable design time. But attempts to translate standard equations into machine language have presented difficulties requiring a completely new set of equations. While they are probably too awkward for use in manual computation, the new formulas described in this article have checked out perfectly against results obtained manually.

Mr. Bridge has had 15 years' experience with the du Pont Co. in the power and piping field, and 10 years since then with various construction companies in the design of chemical and petroleum plants. For the past seven years he has been employed by the Catalytic Construction Co. He is currently working with a group of engineers at Oak Ridge, Tenn., on the design of a high energy cyclotron. This is the fifth article that Mr. Bridge has authored for Heating, Piping & Air Conditioning. In one of these, published in 1950, he developed a method of estimating approximate thermal expansion stresses and thrusts in piping systems. With the coming of computers, he feels that it is no longer necessary to make such rough approximations, since rigorous computer solutions are now feasible.

BY THEODORE E. BRIDGE
Piping Design Consultant

RECENTLY, in the preparation of a pipe stress program for the Burroughs E-101 computer, we pretty much translated the Spielvogel and Lochak equations into machine language to produce a workable program. In so doing, however, the procedure resulted in some undesirable effects:

1) Slant pipe corrections were awkward to handle.

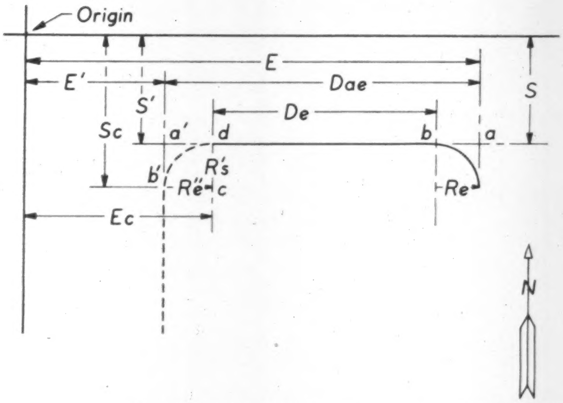
2) In preparing the input data sheet, the designer was required to insert codes to tell the machine the orientation of each member. This required mental effort on his part.

3) Problems were limited to three anchors or less.

4) Calculation of relative expansion at the anchor was complicated.

In an attempt to overcome these difficulties, it was necessary to develop a new set of equations with which the machine could evaluate the correct shape coefficients irrespective of the orientation of the pipe. The designer would merely enter the coordinates at the apex of every elbow, and the machine (using these formulas) would do the rest.

We have not yet had an opportunity to write and debug a program based on these formulas; but a manual solution of the Hovgaard problem using the formulas checked out perfectly. The formulas are designed for use on a computer. They are quite awkward when used in



1 PLAN VIEW of a pipe member will clarify meanings of many of the symbols referred to in text. Shape constants for straight pipe shown in solid line are currently being evaluated. Previous member for which constants have been calculated is shown in dotted line. Shape constants for elbow shown in dotted line are currently being evaluated

a manual computation. (We would greatly appreciate comments from readers interested in this problem.)

Many methods have been developed for manual calculation of pipe stress, but none of the published work that we have examined is readily adaptable to programming into a computer. Of course, several computer programs have been prepared, but none of the detail has been published.

We intend to give here a set of formulas that might be readily translated into a computer program by a programmer not necessarily experienced in the calculation of pipe stress. Let's start with the basic equations for a two-anchor problem. These will later be expanded to cover many more than two anchors.

We will use a set of coordinates parallel to the *south*, *up*, and *east* directions. For a two-anchor problem, six quantities must be determined: *Fs*, *Fu*, and *Fe* are components of force (or thrust) at the anchor (in pounds); *Ms*, *Mu*, and *Me* are components of bending moment at the anchor (in foot-pounds).

The following simultaneous equations must be solved.

$$(Ys) = (Ls)Ms + (O)Mu + (O)Me + (O)Fs + (Lse)Fu - (Lsu)Fe$$

$$(Yu) = (O)Ms + (Lu)Mu + (O)Me - (Lue)Fs + (O)Fu + (Lus)Fe$$

$$(Ye) = (O)Ms + (O)Mu + (Le)Me + (Leu)Fs - (Les)Fu + (O)Fe$$

$$(Zs) = (O)Ms - (Lue)Mu + (Leu)Me + (Is)Fs - (Isu)Fu - (Ise)Fe$$

$$(Zu) = (Lse)Ms + (O)Mu - (Les)Me - (Isu)Fs + (Iu)Fe - (Iue)Fe$$

$$(Ze) = -(Lsu)Me + (Lus)Mu + (O)Me - (Ise)Fs - (Iue)Fu + (Ie)Fe$$

The symbols enclosed in parentheses above are shape constants that will be defined later. It is convenient to arrange these shape constants in a matrix as follows:

$$\begin{array}{lllllll}
Ls & O & O & O & Lse & -Lsu & Ys \\
O & Lu & O & -Lue & O & Lus & Yu \\
O & O & Le & Leu & -Les & O & Ye \\
O & -Lue & Leu & Is & -Isu & -Ise & Zs \\
Lse & O & -Les & -Isu & Iu & -Iue & Zu \\
-Lsu & Lus & O & -Ise & -Iue & Ie & Ze
\end{array}$$

Formulas Aid Computing Shape Constants

The following formulas have been derived to facilitate machine computation of shape constants for a pipe stress problem. Using these formulas, a computer program will correctly evaluate shape constants for any and all pipe orientations.

First, look at the input data that is needed to calculate shape constants. *Ys*, *Yu*, and *Ye* are angular displacement at the anchor (in radians). This is usually taken as zero as the equipment to which the pipe is connected is usually quite rigid. *Zs*, *Zu*, and *Ze* are the components of motion that take place at the anchor (in inches).

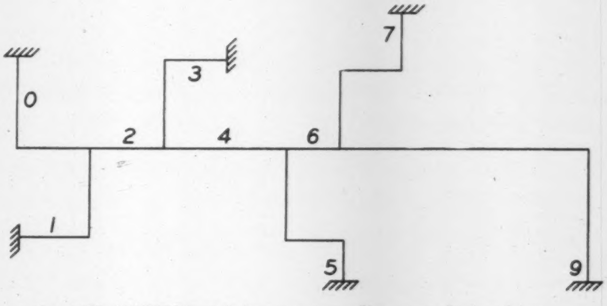
$$Zs = Gs - Das\ B/100;\ Zu = Gu - Dau\ B/100;\ Ze = Ge - Dae\ B/100$$

Gs, *Gu* and *Ge* are components of the motion of the anchor (in inches). *Das*, *Dau*, and *Dae* are differences in the *south*, *up*, and *east* directions between the anchors (in feet).

B is the expansion coefficient taken from the Piping Code. It varies with the material and operating temperature (inches per 100 ft).

For each member, the input data for *S*, *U*, *E*, *K*, *B*, *R*, *I*, *E**, and *N* will be required. A member will include an elbow and a piece of straight pipe as shown in Fig. 1.

S = *south* coordinate of the apex of the elbow, ft
U = *up* coordinate of the apex of the elbow, ft
E = *east* coordinate of the apex of the elbow, ft
K = flattening effect flexibility factor taken from the Piping Code
B = expansion coefficient, per 100 ft
R = radius of the elbow, ft
I = moment of inertia of the pipe cross-section, in.^{4}
E^* = Young's modulus of elasiticity, psi



2 SIX-ANCHOR piping system diagram shows how numbers are assigned to each branch

0+1	0	0	0	0
0	0+2+3	0+2	0+2	0+2
0	0+2	0+2+4+5	0+2+4	0+2+4
0	0+2	0+2+4	0+2+4+6+7	0+2+4+6
0	0+2	0+2+4	0+2+4+6	0+2+4+6+9

3 EACH BLOCK in this matrix diagram contains a 6 x 6 matrix made up of shape coefficients calculated for branch of Fig. 2 indicated by numbers in block diagram. Two or more numbers joined by plus sign means that each term of one matrix is to be added to the corresponding term of the other

$N =$ number of the branch. (For a two-anchor problem, this will be zero.)

Since shape constants for only one member can be figured at any one time, the same set of symbols will be used for each member. When a symbol is modified with a prime (as for example S′) it will refer to the preceding member. However, E″ is Young's modulus of elasticity for the preceding member. E′ is the *east* coordinate at the apex of the preceding member.)

The member shown in Fig. 1 in solid line represents the straight pipe currently being evaluated. The dotted line shows the location of the last straight pipe member for which shape constants have already been calculated. Shape constants for the elbow shown dotted are currently being evaluated. It was necessary to wait until data for the current member were entered before calculating shape constants for the preceding elbow. The orientation of the elbow was not defined until data for the current member was entered.

$$\begin{aligned}
Das &= S - S' \\
Dau &= U - U' \\
Dae &= E - E' \\
La^2 &= (Das)^2 + (Dau)^2 + (Dae)^2 \\
Rs &= R\ Das/La;\ Rs'' = Das\ R'/La;\ Rs^* = Rs' - Rs'' \\
Ru &= R\ Dau/La;\ Ru'' = Dau\ R'/La;\ Ru^* = Ru' - Ru'' \\
Re &= R\ Dae/La;\ Re'' = Dae\ R'/La;\ Re^* = Re' - Re'' \\
Sb &= S - Rs \\
Ub &= U - Ru \\
Eb &= E - Re \\
Sd &= S' + Rs'' \\
Ud &= U' + Ru'' \\
Ed &= E' + Re'' \\
Sc &= Sb' + Rs'' \\
Uc &= Ub' + Ru'' \\
Ec &= Eb' + Re'' \\
Ds &= Sb - Sd \\
Du &= Ub - Ud \\
De &= Eb - Ed \\
Gs^* &= -Das\ B/100 \\
Gu^* &= -Dau\ B/100 \\
Ge^* &= -Dae\ B/100
\end{aligned}$$

The following shape constants are to be added into the matrix to allow for the flexibility of the straight pipe portion of the member:

$$\begin{aligned}
Ls^2 &= (1.69\ Ds^2 + Du^2 + De^2)\ (1728/E^*I)^2 \\
Lu^2 &= (Ds^2 + 1.69\ Du^2 + De^2)\ (1728/E^*I)^2 \\
Le^2 &= (Ds^2 + Du^2 + 1.69\ De^2)\ (1728/E^*I)^2 \\
Lsu &= Ls\ (Ud + Ub)/2 \\
Lse &= Ls\ (Ed + Eb)/2 \\
Lue &= Lu\ (Ed + Eb)/2 \\
Lus &= Lu\ (Sd + Sb)/2 \\
Les &= Le\ (Sd + Sb)/2 \\
Leu &= Le\ (Ud + Ub)/2 \\
Is &= [(Ud^2 + Ud\ Ub + Ub^2)\ Le + (Ed^2 + Ed\ Eb + Eb^2) \\
&\quad Lu]/3 \\
Iu &= [(Ed^2 + Ed\ Eb + Eb^2)\ Ls + (Sd^2 + Sd\ Sb + Sb^2) \\
&\quad Le]/3 \\
Ie &= [(Sd^2 + Sd\ Sb + Sb^2)\ Lu + (Ud^2 + Ud\ Ub + Ub^2) \\
&\quad Ls]/3 \\
Iue &= [Ed\ (2\ Ud + Ub) + Eb\ (2\ Ub + Ud)]\ Ls/6 \\
Ies &= [Sd\ (2\ Ed + Eb) + Sb\ (2\ Eb + Ed)]\ Lu/6 \\
Isu &= [Ud\ (2\ Sd + Sb) + Ub\ (2\ Sb + Sd)]\ Le/6
\end{aligned}$$

The following shape constants are to be added into the matrix to allow for the flexibility of the elbow portion of the member:

$$\begin{aligned}
Ls &= (1.3\ Rs^* + K'Ru^* + K'Re^*)\ (0.7854)\ (1728/E''I') \\
Lu &= (K'\ Rs^* + 1.3\ Ru^* + K'Re^*)\ (0.7854)\ (1728/E''I') \\
Le &= (K'Rs^* + K'Ru^* + 1.3\ Re^*)\ (0.7854)\ (1728/E''I')
\end{aligned}$$

(All items in the above three equations must be made positive, regardless of apparent sign.)

$$\begin{aligned}
Lsu &= Ls\ (Uc + 0.637\ Ru^*) \\
Lse &= Ls\ (Ec + 0.637\ Re^*) \\
Lue &= Lu\ (Ec + 0.637\ Re^*) \\
Lus &= Lu\ (Sc + 0.637\ Rs^*) \\
Les &= Le\ (Sc + 0.637\ Rs^*) \\
Leu &= Le\ (Uc + 0.637\ Ru^*) \\
Is &= Le\ (1.27\ Uc\ Ru^* + Uc^2 + 0.5\ Ru^{*2}) \\
&\quad + Lu\ (1.27\ Ec\ Re^* + Ec^2 + 0.5\ Re^{*2}) \\
Iu &= Ls\ (1.27\ Ec\ Re^* + Ec^2 + 0.5\ Re^{*2}) + Le\ (1.27\ Sc\ Rs^* \\
&\quad + Sc^2 + 0.5\ Rs^{*2}) \\
Ie &= Lu\ (1.27\ Sc\ Rs^* + Sc^2 + 0.5\ Rs^{*2}) + Ls\ (1.27\ Uc\ Ru^* \\
&\quad + Uc^2 + 0.5\ Ru^{*2}) \\
Iue &= Ls\ [Uc\ Ec + 0.637\ (Uc\ Re^* + Ec\ Ru^* \\
&\quad + 0.5\ Ru^*\ Re^*)] \\
Ies &= Lu\ [Ec\ Sc + 0.637\ (Ec\ Rs^* + Sc\ Re^* \\
&\quad + 0.5\ Re^*\ Rs^*)] \\
Isu &= Le\ [Sc\ Uc + 0.637\ (Sc\ Ru^* + Uc\ Rs^* \\
&\quad + 0.5\ Re^*\ Ru^*)]
\end{aligned}$$

Solve Six-Anchor Problem

Fig. 2 shows a six-anchor problem. In this section, let's expand the 6 × 6 matrix given earlier into a 30 × 30 matrix to cover such a problem. Six equations are required for each anchor (not counting the first). Thus, for the six-anchor problem of Fig. 2, 30 equations are needed.

You will note from Fig. 2 that one anchor on the left of the figure is assumed to be fixed. This is assigned the number zero. Every other anchor is assigned a consecutive odd number. A portion of the pipe joining two odd numbered branches is assigned an even number in sequence between the odd numbers assigned to the anchor branches, Thus, each branch is assigned a number — odd numbers at the anchors and even numbers in between. Do not be concerned that the piping in Fig. 2 appears to be all in the same plane. This is a diagram only. The formulas will apply quite as well to a three-dimensional system as to a two.

For each branch in Fig. 2, we must prepare one 6 × 6 matrix made up of the shape coefficients calculated for that particular branch. Each of these matrices is represented by the number of the branch in Fig. 3. Each block in this diagram represents all 36 terms of a 6 × 6 matrix. When two or more numbers in a block are shown connected by a plus sign, it means that every term in one matrix is to be added to the corresponding term in the other. The completed matrix (30 × 30) will represent 30 simultaneous equations and may be solved by conventional methods.

Limited to 90 Deg Bends

Strictly speaking, the formulas for shape constants at the elbow apply only to 90 deg bends. Bends other than 90 deg can be very closely approximated by reducing the radius *R* in proportion to the ratio of the arc with 90 deg. For example, for a 45 deg bend, enter a radius equal to half (45/90) of the actual radius. It is unfortunate that such an approximation is necessary. As yet, we have found no reasonably simple way to improve these formulas in this regard. ‡

SAMUEL R. LEWIS, consulting mechanical engineer and a member of Heating, Piping & Air Conditioning's board of consulting and contributing editors, comments informally on practical problems in the field.

Sam Lewis says:

"We must provide controlled means of reheating air"

THIRTY YEARS AGO I designed a ventilating system for one segment of the first story in a large downtown office building. This plant employed air from the outdoors and warmed it when necessary to about 70 F. It filtered out some of the dust and delivered the air through encased floor-mounted steam convectors below the great windows.

Steam supply valves for these convectors were controlled by wall-mounted thermostats. Spent air was removed by an exhaust fan which forced it outdoors through a tall vertical shaft. The volume of air circulated was about 1½ cfm per sq ft of office floor space.

This system served acceptably until the original leasehold was cut into several smaller areas and until refrigerated cooling and more intense illumination were required. The owner of the building, apparently considering that I was no longer around, removed the original encased convectors and changed the air delivery from upward, around the convectors, near the floor, to horizontal, overhead, without any reheating convectors.

He installed several self-contained, fan equipped electric refrigerating machines, each having a cooling coil and centrifugal fan. He extended the original air supply ducts to deliver the air supply for ventilation through these machines. The original arrangements for removal of spent air were retained.

Thus, the supply of new air from the outdoors could be cooled in warm weather and the greatly increased volume of air circulated was pleasant in summer. This increase was due to the effect of the original supply fan plus that of the booster fans in the refrigerating units.

When summer was succeeded by cool weather, however, the volume of air delivered into the rooms by the original ventilating system was reduced by the resistance of the refrigerating units unless the fans in these units were operated. This was increased to the extent of unbearable drafts whenever the fans in the units were operated. There were no heating coils in the added refrigerating units.

The lesson is published hereby that, if we must cool an originally ventilated office, we should not connect unit refrigerating machines into the original air supply ducts unless we provide controlled means of reheating the air that is being delivered. Air conditioning involves warming to a reasonable extent the cooled and dehumidified air supply. The owner in this case must, at considerable expense to himself and inconvenience to his tenants, resort to one or more of the following remedies:

1) Rebuild or replace the original ventilating system with refrigerating coils prior to the reheating coils.

2) Install controlled reheating coils in the refrigerating units to warm the air after it will have passed the cooling coils.

3) Disconnect entirely the air supply ducts from the refrigerating units, allowing the units merely to recirculate the room air in summer.

Correction by prescription No. 1 will be exceedingly costly since spaces are cramped in the old building and it will be necessary to rebuild the plant which also serves the remaining original leasehold.

Correction No. 2 will involve additional steamfitting and rebuilding of the refrigerating units so as to gain space in each one for the heating coils.

Correction No. 3 will give reasonable winter results, but the effect in warm and intermediate weather will appear very slow and the cooling effect from the units will seem deficient.

If any of the corrections are attempted, the horizontal current of air delivered toward the suspended fluorescent lights must be kept from bounding downward from the sides of the fixtures. This might possibly be done by greatly enlarged air delivery openings at very low velocity or by an entirely different method of illumination which will supersede the horizontal lighting fixture troughs that cause the bouncing. ǂ

Roof Spraying Systems Offer Low Cost, Effective Relief from Summer Heat

. . . in buildings with large roof areas

• Occupants in buildings with flat roof areas can be given economical, perceptible heat relief through roof spraying systems. ITT Laboratories, which either owns or rents several structures of this type, has used these systems for several years with great success. This article, a testimonial for roof spraying systems, describes ITT's actual installations and tells many of their design considerations.

Mr. Kind is a 1933 mechanical engineering graduate from Stevens Institute of Technology. Prior to joining ITT, he was employed in the plant engineering departments of Western Electric, General Foods, du Pont, and P. Ballentine and Sons. He is a licensed professional engineer and a member of the American Institute of Plant Engineers.

BY W. O. KIND
Plant Engineer
ITT Laboratories

At ITT Laboratories, Div. of International Telephone and Telegraph Corp., we now have four years' experience with roof sprays. This has given us sufficient time to evaluate the installations we have made in the course of these years.

When we first considered roof cooling, we were somewhat surprised to find, in spite of what appeared to be distinct advantages, that there were very few actual installations in our area. In fact, there were enough instances of buildings that once had them, and then abandoned them, to sober our initially exuberant feelings about them.

About five years ago, ITT completed a 126,000 sq ft building at Nutley, N. J. It was designed as a factory building for manufacture of telephone and electronic equipment, with a small area reserved for laboratory work. By the time the building was completed, it was decided that the entire building would be devoted to laboratory work, although it was realized that conditions would not be ideal for this type of occupancy. The building is rectangular in shape and the short dimension is 286 ft, so there is considerable inside space.

Hot Summer Brings Complaints

The first summer's occupancy proved that the building was hot — just as we expected. As complaints began to mount, it was realized that air conditioning was the ultimate solution. But it was also apparent that something had to be done in the meantime, if at all possible.

The building is primarily one story, so the large expanse of roof was recognized as a source of considerable heat. This roof consisted of a steel deck (exposed underneath), 1 in. of rigid insulation, built-up roofing, and a gravel surface. Distances from floor to ceiling varied from 14 ft, 4 in. to 15 ft, 10 in. due to the roof pitch of $\frac{1}{8}$ in. per ft.

Roof spraying immediately suggested itself because of the availability of a limited amount of water that was going to waste from the condensers of the 65 tons of air conditioning installed in special areas.

The flooded roof system was not considered suitable because in our type of business a roof must be capable of being walked upon in connection with the many antenna tests that are made. It was felt to be too cumbersome, as well as offering less cooling efficiency than an evaporative spray system.

Also considered was additional and greatly increased ventilation. This was felt to have less salvage-

IDEAL ROOF CONSTRUCTION for roof spraying system has gravel top, slight pitch. Gravel eliminates "bird bath" puddles, algae growth maintenance problem; pitch provides good evaporation characteristics

ability when the comfort air conditioning eventually was installed, and also did not appear to provide as much cooling as comfortably or economically as the roof spray.

Save $48,000 Cooling Costs

The economics of the roof spray seemed especially attractive when related to the reduction in air conditioning tonnage it permits. In our case, this was an estimated 80 tons. At $600 per ton, this represents $48,000 of air conditioning. We installed the roof spray for less than $15,000, including all water collecting piping and regulating valves.

Operating costs for water and electricity are practically nil since we were fortunate enough to have sufficient city water pressure (90 psi) to be able to operate without a booster pump. As water was going to waste from the condensers, we incurred no cost on this score either. The 80 tons of air conditioning that the spray will save when we become completely air conditioned would have required a considerable operating cost.

Install Six-Zone System

A six-zone, copper tube spray system was installed on the main roof in the spring of 1955. Each zone runs automatically wetted one-sixth of the time while the other five zones are drying. The installation was very simple, occupying a two-man crew less than two weeks.

There was a slight deficiency of water for proper spray pattern. This was probably because less condenser waste water was being obtained than was anticipated, due to the low temperature of the city water in spring as compared to later in the summer.

A city water makeup line through a pressure regulating valve was piped into the system. But, with the advent of summer, the condensers used more water and the makeup tapered off to zero.

Fig. 1 shows our schematic arrangement. The relief valve to drain gets rid of excess water and insures a constant water pressure on the system so that a steady spray pattern can be maintained. With several package air conditioning units as the source of our supply, we would otherwise be subject to fluctuations in water supply as units cut in and out.

The type of spray selected was one consisting of pierced pipe for which the manufacturer claimed no cleaning would be necessary. This has turned out to be the case; in the four years of operation no time has been spent in cleaning (except for the main filter).

We had expected to run into opposition to the installation of the roof spray from the roofing contractor and bonder. No difficulty was experienced in getting permission — attributable to the feeling that roof sprays may be beneficial to a roof, as it protects it from the sun.

As the roof contains a considerable number of air intakes and exhausts, we were concerned about water spray getting into the building through them. Fortunately, it was possible to so lay out the piping that no difficulty was experienced. At the same time, satisfactory wetting of the roof was achieved in the vicinity of these intakes.

Due to the pitch of the roof and the tendency of the piping to drain out at the low point after every wetting cycle, the last few feet of roof at the low edges received too much water and formed puddles. But this was not considered serious enough to rectify, which could have been done by installing vertical return bends in the branch lines to prevent the entire branch line from draining out the low end.

Building Noticeably Cooler

When the system was put into operation, the resulting improvement in comfort established the roof spray as eminently satisfactory. Personnel noticed that the building was perceptibly cooler.

To determine how much cooler, temperature readings were taken at the 5 ft level in the building several times during the day, in relation to the outside shade temperature. These were compared with similar readings taken the previous summer when the roof was unsprinklered. We were surprised to note that an improvement of only about 1.5 F was all that could be detected. This was so small that we did not feel it was statistically very reliable and certainly did not explain the definite increase in comfort.

Readings were then taken at the 10 ft level and under the roof. These showed marked differences in favor of the sprinklered condition. We then concluded that the increase in comfort was obtained primarily because of reversal of radiant heat flow. Whereas the roof was originally a hot panel radiating heat to the employees, when sprayed, it permitted the employees' body heat to radiate to it.

The beneficial effects of the spray have been corroborated on several occasions when it has become necessary to turn off a zone because of work on the roof. The employees under this zone, though unaware that the water has been turned off, soon start to complain of the heat.

Total maintenance of the system has thus far been very small. Careful drainage of all water must be made when shutting down for the winter season. In spite of this, we seem to experience a half-dozen splits in the copper tubing each spring. This appears to be due to snow getting into the tubing perforations and eventually forming sufficient ice, where conditions are just right, to result in a few burst tubes. These are, however, easy to repair.

The laboratories rent a somewhat old fashioned mill type building in adjacent Belleville, N. J. Areas under the wooden roof were very hot in the summer. As the lease runs out shortly, really low cost relief was all that could be justified. So, we simply ran hoses out on the roofs from the nearest city water lines and connected them to either oscillating lawn sprinklers or perforated plastic hose.

Discernible relief was achieved, even with these simple arrangements. This has led us to believe that most any kind of roof spray is better than none, where the roof area and construction are such as to have sufficient influence on the inside conditions.

New Lab Air Conditioned

Last spring a new 100,000 sq ft, two-story laboratory building was completed on the Nutley grounds. This building is fully air conditioned. From the early planning, roof cooling was considered. Several systems of air conditioning were investigated and the estimates showed that the most economical would be one using well water.

This water, obtained at 55 F, is chilled in a package 100 ton water chiller to 49 F. It goes to the air cooling coils of four multi-zone units. Then, it is used for condenser cooling and roof spray. Not only did this system show favorable first cost; it also has very low operating cost.

The roof of this building was constructed flat and without gravel. We learned that a flat roof is very difficult to construct, because the dead weight of the steel and roofing causes a deflection at mid-span of the bays. Water puddles as much as 1 in. deep appeared in some of the bays. The building contractor had warned us we would experience "bird baths," but we did not feel a bad situation would result. As the total area of these puddles is small, they cannot have a very great effect on the cooling efficiency. We did note toward the end of summer, however, that algae growths appeared in these puddles. We expect to remedy this condition by applying roof gravel or by building up with additional roofing.

A very thick layer of insulation in the roof could probably have reduced the sun load practically as much as the roof spray. We felt, however, that this would not have produced a satisfactory roof upon which to walk and work. Also, if we wish to eliminate roof solar load, we can do so by turning on the roof spray. If we want to use this energy to help heat the building in the winter, we can do that, too.

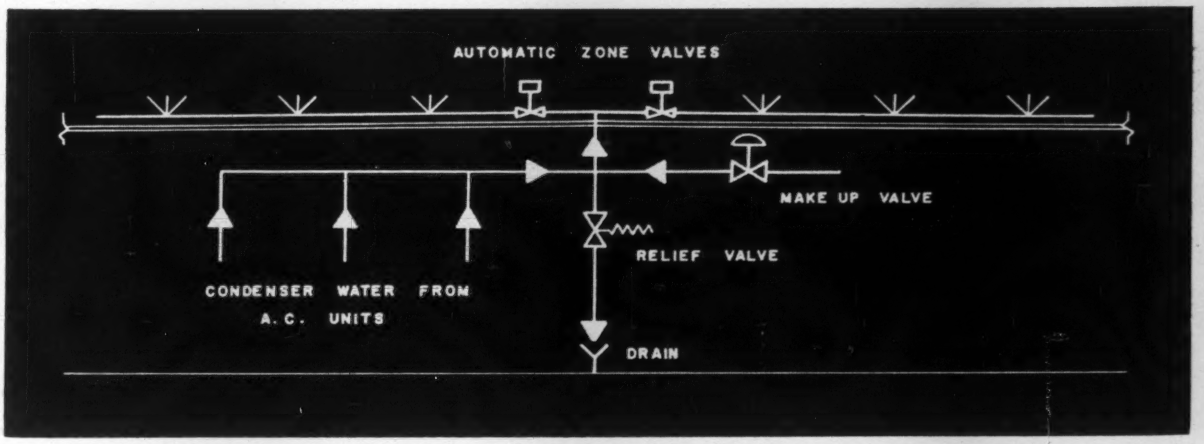
Solves Fly Ash Problem

The roof spray on this building has helped us through a difficulty that was not anticipated. A considerable amount of paper is burned daily, and the fly ash plagued us by getting through the filters and depositing itself on desks and equipment.

Because of the relationship of the air conditioning intakes, the roof and fire wall parapets, and the incinerator stack, fly ash settling on the roof was channeled into the air conditioning system. However, when the roof sprays were put into operation, the fly ash was wetted and washed down the roof drains.

This ended the complaints and bought sufficient time to redesign the filter system so it will function satisfactorily when the sprays are off in the cool weather.

On several occasions we have installed air conditioning under a sprayed roof. In computing the total cooling load, we assign the roof solar load a value of zero. This gives the roof spray credit for greater efficiency than any of the textbook



1 SCHEMATIC ARRANGEMENT of zoned spray system shown above. Relief valve to drain removes excess water, insures constant water pressure. With several package air conditioning units used as water source, spraying system would be subject to fluctuations in water supply as units cut in and out

tables do. However, we have not so far run into any trouble in meeting design conditions by reason of this assumption.

Need Good Coverage, Pressure

The important requisites for a roof spray system are satisfactory water in sufficient volume and pressure. Good spray coverage can be obtained with 20 psi or slightly lower if necessary. Somewhat higher pressures are preferable and will permit more economical layout. These figures refer to minimum pressures at the extremities of the system, so sufficient pressure must be available at the supply to the system to insure minimum pressure after allowing for line drop through the system.

The water quantity needed can be determined from the sun load, plus an allowance for drift loss, waste to drains, and other inefficiencies. The sun load varies with latitude and can be obtained from published tables.

Take the case of a 100,000 sq ft roof at 40 deg latitude: Using 270 Btu per sq ft per hr as the maximum solar energy striking the roof, we have (100,000 × 270)/60 = 450,000 Btu per min. to be dissipated by the roof spray. A pound of water absorbs about 1000 Btu in evaporating. Therefore 450 lb per min., or about 54 gpm, are theoretically needed. Allowing one-third for losses, the actual water required is about 72 gpm.

As this takes care of maximum solar load, it is more than necessary for the less-than-maximum load periods which make up the great majority of the time. If it is desired to conserve water, as is the case where straight city water is used, a thermostat in the roof can be utilized to shut off excess water when it is not required.

Water could be applied to the entire roof long enough to wet it, then be shut off while evaporation takes place. For larger sized jobs, however, the roof is usually zoned, number of zones depending on several factors: water pressure and maximum flow rates available, spacing of branch lines, pattern of individual sprays, and economics of the materials used.

Design for Pressure Drop

It is reasonable to design for a 10 psi drop to the extremities of the zones in an installation of this size. In our River Road building we provided a minimum of 32 psi in the supply line at a point 5 ft below the roof by means of the makeup water regulating valve. In normal operation, because of the number of condensers now supplying the system, some water is bled off through the relief valve which keeps maximum pressure at 35 psi.

For this six-zone system we use 2½ in. copper mains. The setting on the zone times that gives best results is 50 sec wetting per zone, and 4 min., 10 sec drying.

Most roofs have obstructions such as air intakes, exhausts, equipment doghouses, etc. If possible, these should be constructed of aluminum rather than galvanized iron to eliminate the painting necessary to avoid rusting. The spray system must be custom adapted to these obstructions, and the ability of the system to wet the roof without getting water inside them should be ascertained. Where windows are liable to be open under the edge of a roof, the entrance of drifted spray would present an intolerable situation. The spray must be capable of preventing this under any wind condition.

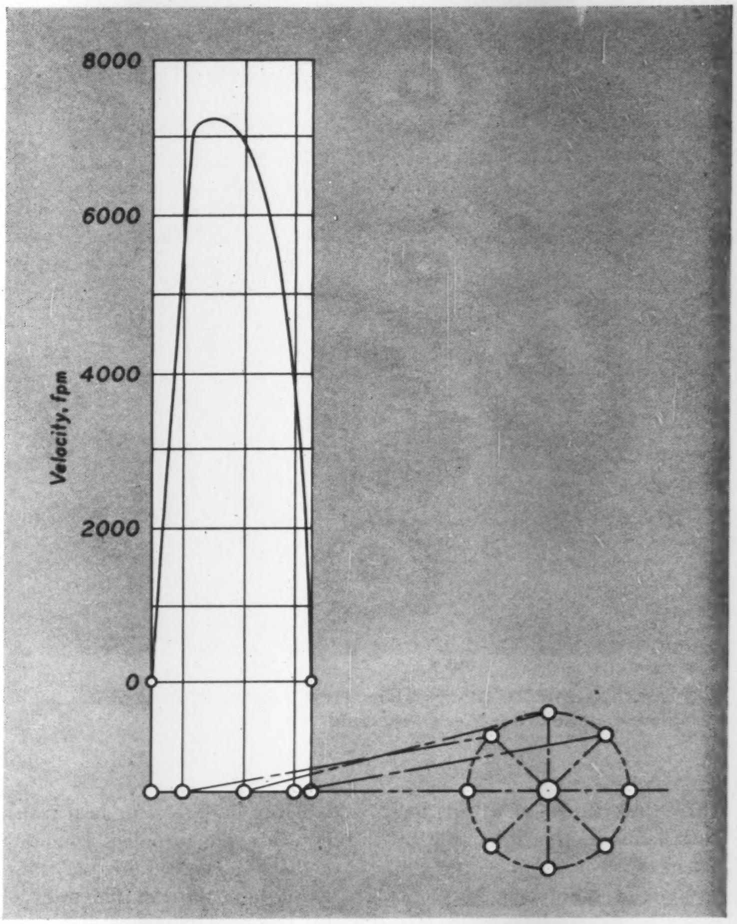
Method Needs to Be Exploited

Roof cooling does not appear to be fully exploited in areas where it will have definite benefits. The design of new buildings with appreciable roof areas should always include an investigation of the economics and advantages of roof sprays. If such is indicated, the roof should be constructed to obtain full benefit of the sprays. This covers such factors as roof pitch, materials, amount of insulation, use of gravel, and drainability of the piping. With a clean water supply, negligible maintenance cleaning is required. There are also systems that can function with an appreciable amount of contaminants. ≠

What Are We Paying for High Velocity In Refrigerant Piping Design, Operation?

• What price high velocity in refrigerant piping? Often it can be costly. Full consideration must be given to many factors in order to arrive at the pipe size and fluid velocity that will give the most efficient, most economical operation. Investigations conducted by the author's firm indicate: (1) It is seldom necessary to design suction piping for laminar flow unless for such systems as centrifugal compressors where the differential in pressure between the evaporator and condenser is very close. (2) Transition flow is desirable if economy in plant operation is critical. (3) Keeping pressure drop to a minimum permits greater production for existing compressors or allows smaller compressors to be specified for a given production requirement. (4) Operating with large pressure drop causes the suction vapor to be highly superheated. When the vapor entering the compressor is highly superheated, it causes the compressor to be heated above normal. The result is that greater maintenance is required to keep the compressor in normal condition than would otherwise be necessary.

Mr. Vetter's long career in the mechanical engineering field had its beginning back in 1905 when he became a draftsman for a marine machinery company at the age of 15. He gained his technical training by attending evening classes at the Cooper Institute in New York and in 1921 was employed as chief engineer for the Baker Ice Machine Co. From 1930 until his retirement from active participation in the business last year, Mr. Vetter operated his own consulting engineering firm. Over the years he has authored several articles for Heating, Piping & Air Conditioning.



1 VAPOR in a reciprocating compressor does not enter cylinders at an even rate, as is shown here. Note that vapor velocity reached its maximum before halfway point in intake stroke

BY HERMAN VETTER
Vetter Engineering Co.
Industrial Consulting Engineers

TODAY'S TREND in the design of mechanical systems is toward the use of higher fluid velocities and smaller pipe sizes. What is this costing us? In the case of ammonia compressor operation, it might be plenty—as this article will reveal.

Let's first analyze the speed or velocity of the vapor in the suction line. An increase in line velocity increases the pressure drop. An increase in pressure drop lowers the volumetric efficiency of the compressor and increases the horsepower per ton.

Clearly understand what volumetric efficiency is: Many are under the impression that it is the percentage of the compressor displacement that is filled with vapor. In other words, if the compressor is operating at 75 percent volumetric efficiency, only 75 percent of the cylinder is filled with vapor. This is not so true; the cylinder is *filled* with vapor at every suction stroke. It does mean, however, that if the compressor is operated under a 5 psig pressure drop, that the cylinder is filled with vapor having a density of 5 psig less in pressure than that existing in the evaporator.

It is not only the pressure drop in the suction line that must be considered, but the total pressure drop between inside the evaporator and inside the cylinder during the suction stroke.

Table 1 shows the effect of pressure drop on the volumetric efficiency. This tabulation also reflects the effect of superheat on the volumetric efficiency. The values given are those that should be obtained if the compressor has no mechanical losses. Allowance should be made for re-expansion loss due to piston head clearance and valve and piston leakage. A reduction of 10 percent should be ample to compensate for these losses. If they are greater than 10 percent, it would be wise to thoroughly overhaul the compressor.

3 Kinds of Fluid Flow

To analyze the cause of pressure drop in pipelines it is necessary to know the nature of the fluid flow.

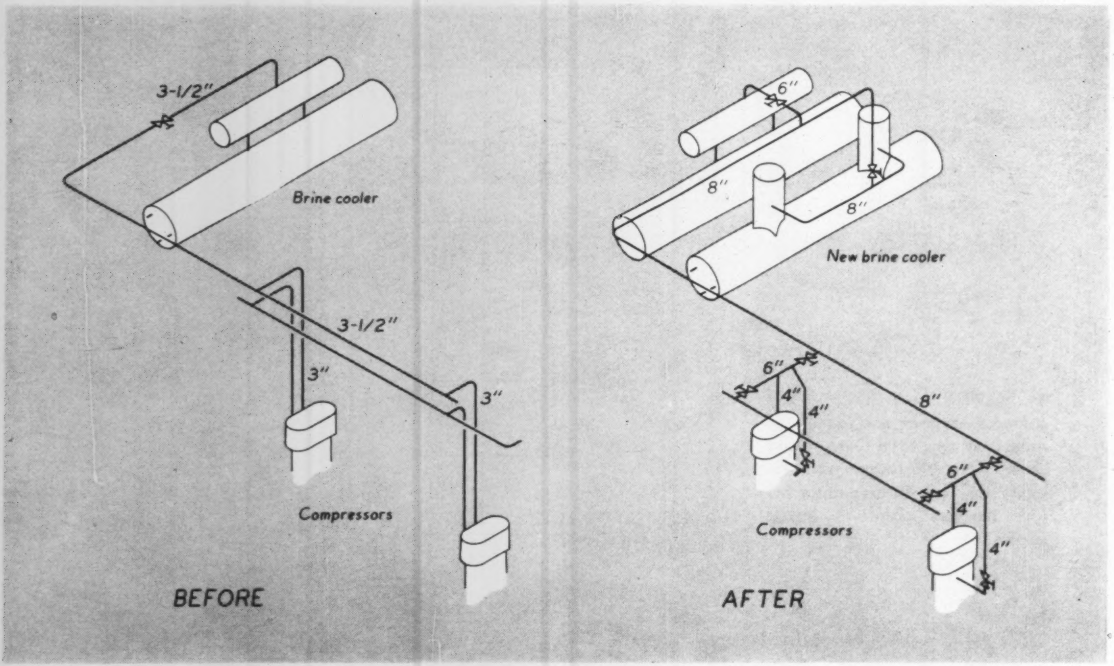


Fig. 2

Fig. 3

2-3 ARRANGEMENT OF SUCTION PIPING in troubled manufacturing plant was as shown in Fig. 2 before corrective modifications illustrated in Fig. 3 were made

There are three kinds of fluid flow: laminar, transition, and turbulent.

When a flow such as suction vapor is conveyed through piping between the evaporator and compressor, it should be either in laminar or transition flow. Turbulent flow should be avoided where possible, except for heat transfer purposes. In fact, turbulent flow is highly desirable for heat transfer, since the turbulent condition of the fluid accelerates the transfer of heat through the walls of the pipe.

The most desirable type of flow for conveying fluids is laminar. However, unless very high efficiency is necessary, transition flow can be used with very good results.

Table 2 shows the type of flow for various sizes of pipe and for various capacities. Reynolds Number values up to 1800 are considered to be in laminar flow. Between 1800 and 4000 are considered transition flow. Values higher than 4000 are turbulent flow.

TABLE 1 — PRESSURE DROP and superheat have this effect on compressor volumetric efficiency. Tabulations are based on evaporator pressure of 19.6 psig, condenser pressure of 154.5 psig

Pressure drop, psig	Superheat				
	0 F	10 F	20 F	30 F	40 F
0	100.00	99.77	97.26	94.90	92.69
1	97.34	96.77	94.35	92.08	89.95
2	94.49	93.80	90.33	89.27	87.16
3	91.80	90.82	88.36	86.47	84.49
4	89.15	87.69	85.69	83.66	81.76
5	86.48	84.91	82.82	80.87	79.01
6	83.69	81.96	79.96	78.10	76.30
7	80.92	79.01	77.12	75.32	73.60
8	78.25	76.10	74.28	72.52	70.88
9	75.32	73.20	71.45	69.70	68.24
10	72.61	68.58	66.83	65.52	64.00
11	70.00	67.30	65.70	64.20	62.80
12	67.20	66.00	62.90	61.50	60.20
13	64.30	61.60	60.00	58.75	57.40
14	61.40	58.70	57.30	56.00	54.75
15	58.70	57.20	55.80	54.50	53.30
16	55.80	51.30	50.20	48.90	47.75
17	53.30	48.30	47.25	46.20	45.20
18	50.30	46.70	45.40	44.30	43.40
19	47.70	43.60	42.60	39.90	38.90
20	44.70	40.70	39.70	38.80	37.90

Compare Various Flow Types

Let's compare what happens when operating with various types of flow. We will use the standard ton condition; namely, 19.6 psig evaporator pressure and 154.5 psig condensing pressure. From Table 2 we have selected 87.30 tons capacity, a 4 in. line for turbulent flow; a 14 in. line for transition flow; and a 30 in. line for laminar flow.

The comparison between transition flow and turbulent flow in Table 3 does not appear very great because the Reynolds Number in this case is much lower than that used in common practice. About 50 years ago, the industry

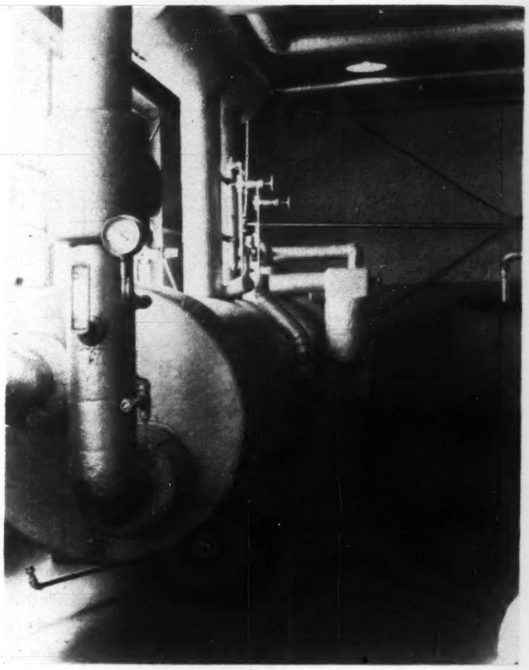


Fig. 4

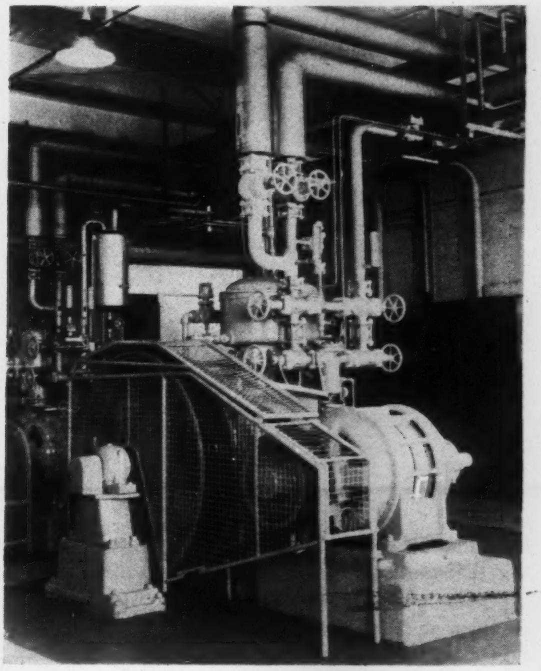


Fig. 5

4-5 ORIGINAL EQUIPMENT serving plant shown schematically in Fig. 2 is pictured above. Fig. 4 is brine cooler; Fig. 5 is piping at compressor

placed a ceiling on pipeline velocity of 2400 fpm. Since then this has been increased to 5000 fpm.

We had discussed pipeline velocity with the chief engineer of a very large manufacturing firm. He would not concede that there was any benefit of low line velocity. When we asked him what are the benefits of high velocity, the only reason he could give was that it permits the use of smaller pipe.

We will now compare the results given in Table 3 with pipe sizes used in general practice. The industry, in selecting pipe sizes, is generally guided by recommendations in the "Equipment Standard" issued by the Air Conditioning and Refrigerating Machinery Association, Inc. In this standard, it is stated that the maximum capacity for a 6 in. line operating at standard ton condition is 306 tons. At this capacity, the vapor velocity would be 5240 fpm. To make a fair comparison, let us assume that the 6 in. line is used for 275 tons of capacity. Under this condition the results would be as follows:

Reynolds Number	29,500
Pressure drop, psig	7.038
Superheat, F	30
Volumetric efficiency, percent	67.78
Total brake horsepower	555.0
Horsepower per ton	2.02
Velocity, fpm	4710

No doubt some readers will say: "Thats fine for a theoretical analysis. But what are the results in actual practice?" The following case histories will answer this question:

•No. 1

Back in 1932 we were engaged in remodeling an ice cream plant.

TABLE 2 — TYPES OF FLOW, as expressed by Reynolds Number, for various sizes of pipe and for various capacities (tons) are given below for 154.5 psig condenser pressure

Evaporator pressure, psig				Flow rate,	Pipe size, in.													
0	10.3	19.6	45.0	cfm	4	6	8	10	12	14	16	18	20	22	24	30	
12.85	21.45	29.10	50.0	100	4,630	**3,060**	**2,310**	1,795	1,545	1,345	1,185	1,070	940	853	785	628	Laminar
25.70	42.90	58.20	100.0	200	9,260	6,120	4,620	**3,590**	**3,090**	**2,690**	**2,370**	**2,140**	1,880	1,706	1,570	1,256	
38.50	64.35	87.30	150.0	300	13,890	9,180	6,930	5,385	4,635	**4,035**	**3,555**	**3,210**	**2,820**	**2,559**	**2,355**	1,884	
51.50	85.80	116.40	200.0	400		12,240	9,240	7,180	6,180	5,380	4,740	4,280	**3,760**	**3,412**	**3,140**	**2,512**	Transition
64.20	107.25	145.50	250.0	500			11,550	8,975	7,725	6,725	5,925	5,350	4,700	4,265	**3,925**	**3,140**	
77.00	128.70	174.62	300.0	600				10,770	9,270	8,070	7,110	6,420	5,640	5,118	4,710	**3,768**	
90.00	150.15	203.70	350.0	700					10,815	9,415	8,295	7,490	6,580	5,971	5,495	4,396	
103.00	171.60	232.80	400.0	800						10,760	9,480	8,560	7,520	6,824	6,280	5,024	
116.50	193.05	261.92	450.0	900							10,665	9,630	8,460	7,677	7,065	5,652	Turbulent
128.85	214.50	291.00	500.0	1000								10,700	9,400	8,530	7,850	6,280	
193.00	321.75	336.50	750.0	1500									14,100	12,795	11,775	9,240	
257.00	429.00	582.00	1000.0	2000												12,560	

6-8 ACTUAL MODIFICATIONS to equipment pictured in Figs. 4 and 5 are illustrated at right. Fig. 6 is new brine cooler. Fig. 7 shows initial suction to compressor. Fig. 8 is dual suction to compressor

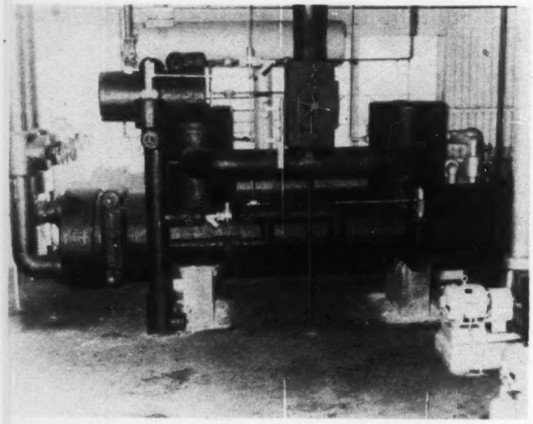


Fig. 6

Our investigation indicated glaring disregard for basic engineering principles. The following is a comparison between the results obtained with those that existed before the changes were made:

	Before	After
Date	Jan. 1932	Jan. 1933
Gal per month	4001	4901
Power consumption, kwhr	11,220	3,480
Power cost	$171.75	$80.34
Consumption, kwhr per gal	2.80	0.71
Power cost, cents per gal	0.042	0.016
Meter, maximum demand, hp	64.34	35.4
Power cost per kwhr, cents	0.0153	0.023

The above includes the power for the dairy machinery as well as for the refrigeration machinery. This was based on a monthly comparison. At the end of the year we checked the yearly results, which are as follows:

Totals:

334,531 gal of ice cream
226,300 kwhr
$2,885.11 power cost

Averages:

0.670 kwhr per gal
0.0086 cents per gal

The size of the suction line before the change was made was 2 in. This was replaced with a 4 in. line. The following gives the velocity and Reynolds Number of these two pipe sizes:

	Before	After
Velocity, fpm	6,065	1,600
Reynolds Number	12,448	6,566

In addition to the economy effected, the owners were able to greatly increase their production without adding more compressors.

•No. 2

In 1944 we were asked to make recommendations for needed changes in an ice cream plant to improve its efficiency. This plant had a capacity of 4,159,297 gal of ice cream, plus frozen novelties, ice making, and truck refrigeration.

The size of the suction line from the ice cream plant was 8 in. After making our analysis, we recommended that a 12 in. line be added. This change permitted the owners to greatly increase their production as well as reduce their power cost $12,000 per year.

The line velocity and Reynolds Number of these lines before and after the change was made are as follows:

	Before	After
Velocity, fpm	3,400	968
Reynolds Number	27,882	11,270

•No. 3

In 1946 we were engaged in remodeling several ice making plants. In one[1], there were two ice making tanks of identical size. A 4 in. suction line connected each tank to a separate compressor. These lines had a cross connection close to the compressor. A third compressor was connected by a line to the cross connection.

The line velocity and Reynolds Number of these lines before and after the changes were made are as follows:

	Before	After
Velocity, fpm	5,140	1,278
Reynolds Number	20,110	10,500

Changing these lines from 4 in. to 8 in. increased the capacity from 152 tons to 167 tons of ice. This increased the earning capacity of the plant about $18,000 per year and improved the compressor operation. Prior to the change, the suction vapor to the third compressor was highly superheated and caused this compressor to operate at excessively high temperature. This resulted in frequent shutdowns to replace broken valve plates. Changing the suction piping permitted cooler vapor to enter the compressor which corrected their valve trouble.

•No. 4

In 1958 we were asked to correct conditions in a manufacturing plant. Our analysis revealed many problems. We will, however, confine our discussion to the effect of

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[1] *Improved Piping Design Aids Refrigerating Plant Results*, by Herman Vetter. Heating Piping & Air Conditioning, June 1948.

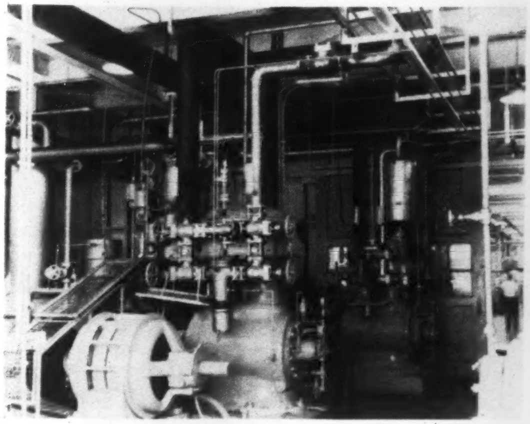


Fig. 7

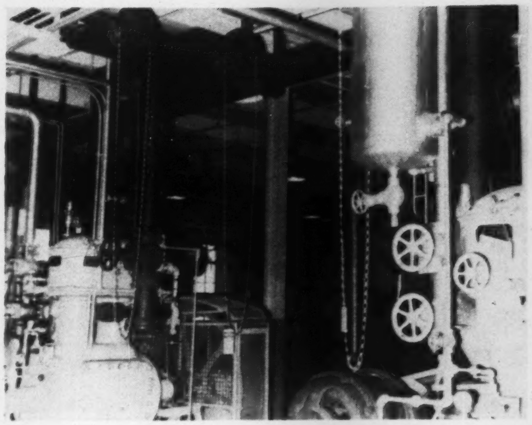


Fig. 8

reducing the pressure drop in the suction line.

The arrangement of the suction piping before the changes were made is shown in Fig. 2. Our modifications are illustrated in Fig. 3.

The original brine cooler is shown in Fig. 4 and the original piping at the compressors in Fig. 5. Fig. 6 illustrates the new brine cooler and the new piping to the compressors is shown in Figs. 7 and 8. Fig. 7 shows the initial suction connection to the compressor and Fig. 8 illustrates the dual suction connection to the compressor.

The compressor operating on the brine cooling system is a 9 in. × 9 in. two-cylinder compressor operating at 300 rpm. Suction line size was increased from 3½ in. to 8 in., and a second suction connection was added to the compressor.

Before any changes were made, we calculated and found that the total pressure drop was 9.5 psig. This included the pressure drop through the strainer and entrance loss into the cylinders, as well as the pipeline loss.

TABLE 3 — COMPARISON of operating conditions resulting from three different types of flow is indicated below

	Pipe size, in.		
	30 (Laminar)	14 (Transition)	4 (Turbulent)
Reynolds Number	1884	4035	13,890
Pressure drop, psig	0.1345	0.1366	1.8325
Superheat, F	10	10.5	12.2
Volumetric efficiency, percent	89.43	89.41	83.80
Total brake horsepower	118.38	124.14	128.78
Horsepower per ton	1.356	1.422	1.475
Velocity, fpm	61.0	280.63	3394

TABLE 4 — BRINE COOLING SYSTEM described in Case No. 4 gave this operating performance before and after modifications were made

	Before	After
Capacity, tons of refrigeration	19.8	32.22
Evaporator temperature, F	−18.0	8.0
Evaporator pressure, psig	4.6	22.0
Condenser temperature, F	84.0	82.2
Condenser pressure, psig	149.0	144.0
Brine capacity, gpm	112.5	225.0
Brine temperature to cooler, F	15.0	14.0
Brine temperature from cooler, F	10.0	10.0
Brine density, Ca Cl_2, Baume	24	24
Specific heat of brine	0.716	0.716
Size of suction line, in.	3.5	8.0
Line velocity, fpm	1,708.33	487.61
Total pressure drop, psig	9.5	0.8264
Superheat of suction vapor, F	48.0	18.0
Brake horsepower	57.50	40.8
Horsepower per ton	2.90	1.27

In our analysis we found that the opening into the cylinders was only 2½ in. Almost half of the total pressure drop was caused by this restricted entrance. In order to reduce this loss, a dual inlet connection was provided. With our design we were able to reduce the total pressure drop to 0.8264 psig.

Table 4 compares the system's operation before and after the changes were made. Note that the volume of brine circulated was increased. In the design of the plant, the brine pumps specified called for a capacity of 250 gpm operating against a head of 70 ft. The operating head was found to be 92.48 feet. Therefore the pumps delivered only 112.5 gpm.

To increase the brine flow without adding new pumps, the piping connections were changed so that the discharge from one pump was connected to the suction of the other. The two would then operate as a two-stage pump and the change increased the pump capacity to 225 gpm.

Save 89,000 Kwhr Annually

Note that the compressor capacity was increased by 12.42 tons, an increase of 61.4 percent. Compressor power was reduced from 57.5 hp to 40.8 hp. As this plant is operated 24 hr per day, 300 days per year, this effected an annual saving of 89,500 kwhr.

The refrigeration capacity given in Table 4 was determined by the weight and temperature difference of the brine circulated. A weir was installed in the brine tank to determine the volume of brine flow.

This brine cooling system operates under a fluctuating load. When the last test was made, the load fluctuated from 24.165 tons to 40.77 tons within a period of 1 hr. The values given in Table 4 are mean averages.

In order to balance this system it would be necessary to reduce the speed of the compressor from 300 rpm to 200 rpm. This reduction was not made, as the owners expect to add another production line which will require additional refrigeration capacity.

Discovery Spurs Research

During our experience with the plant covered in Case No. 1, we discovered a very interesting phenomenon which spurred our research. This plant had two compressors. One day before the plant changes were completed and before the suction header was insulated, we noticed that when only one compressor was operating, the 4 in. suction header was not frosted. In fact, it was not even sweating. The temperature of the ammonia vapor inside of the header was −24 F. However, the 1½ in. connection between the header and the compressor was heavily frosted.

After due investigation we found that the vapor velocity in the 4 in. header was about 800 fpm and the Reynolds Number was 3283. This indicated that the vapor was in a transition state.

Due to the low velocity, the vapor close to the wall of the pipe was practically motionless and served as an insulator for the low temperature vapor flowing through the core of the header.

This opened up possibilities. We compared the cost of a low velocity line not requiring insulation with that of a normal size insulated line. The two line sizes we selected were a 4 in. and 12 in. line.

A 4 in. line conveying 200 cfm of vapor would have a velocity of 2262 fpm. Its Reynolds Number would be 9260, placing it in the turbulent range. A 12 in. line carrying 200 cfm of vapor would have a 250 fpm velocity, and its Reynolds Number would be 3090, placing it in the transition range.

A 12 in. uninsulated line would cost about $2.00 per ft more than a 4 in. insulated line. Let's now compare power costs: The difference would be about 56,370 kwhr per year, which, at 1 cent per kwhr, would amount to about $563.70 per year.

Assuming that the suction line was 500 ft long, the extra cost of the larger size line would be about $1000. This extra cost would be amortized in about two years, after which it would be a net saving.

Other Advantages, Too

There are other advantages in using the larger size line. For example, the cost of maintaining pipe insulation can be rather costly, especially when operating at low temperatures. The larger size line would also increase the volumetric efficiency of the compressors and permit greater production for the same size equipment.

Some comments on high speed compressors are in order. Compressors with speeds up to 360 rpm are considered slow speed; high speed compressors are operated as high as 1160 rpm. When a compressor is operating at 360 rpm, the time allowed for the cylinders to fill with vapor is 0.166 sec and at 1160 rpm the time is only 0.0517 sec. It is quite evident that the time for the vapor to enter the cylinders of a high speed compressor is so short that it is impossible for much vapor to enter.

The vapor in a reciprocating compressor does not enter the cylinders at an even rate, as illustrated in Fig. 1. During the first quarter of the intake stroke, 17.4 percent of the vapor is drawn in; in the second quarter, 39.0 percent; in the third quarter, 31.6 percent; and in the fourth quarter, 12 percent. At the beginning and end of each intake stroke, the vapor velocity is zero and reaches its maximum before reaching the halfway point.

The bulk of the vapor enters the cylinder in about half of the stroke. Therefore the time for the vapor to enter the cylinder is much less than that mentioned above. To show how speed of the compressor affects its capacity and power, we have calculated the results of a 4 in. bore and 4 in. stroke compressor, one operated at 360 rpm and the other at 1160 rpm:

	360 Rpm	1160 Rpm
Capacity	4.97	11.6
Total horsepower	13.20	44.0
Horsepower per ton	2.67	3.66
Pressure drop, psig	2.31	11.96
Volumetric efficiency, percent	81.74	54.18

The above are based on operating at standard ton conditions. These results do not include line loss between the evaporator and the strainer at the compressor.

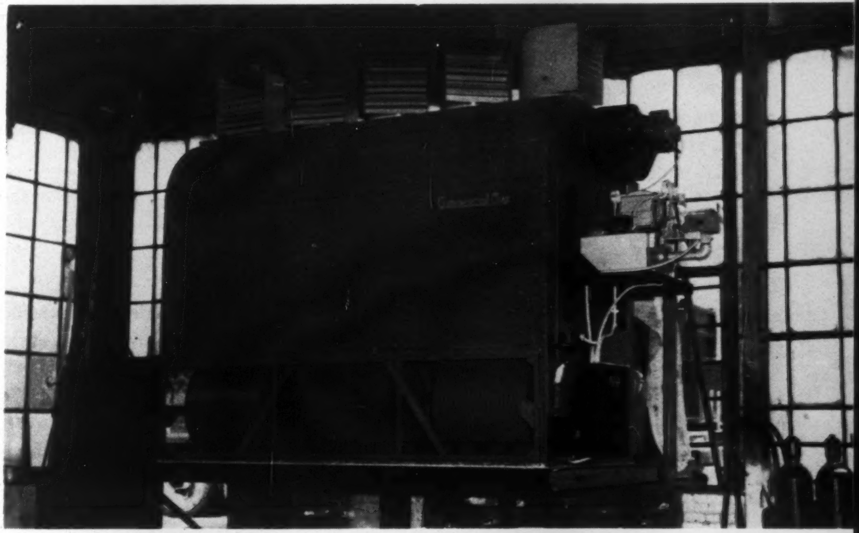
Weigh Costs, Conditions

It is not our intent to condemn the use of high speed compressors. There are conditions in which their use is justified. On board ship, where space and weight is at a premium, the extra cost of power can be justified. In one case in which we had to advise the owner, our investigation showed that the cost of the extra power would equal the difference in cost between the high speed and slow speed compressors in less than five years of operation. ∓

FILTER WALL eases painting large trailer units, increases number of small bodies that can be painted simultaneously. Filters handle 275 cfm per sq ft in exhausting paintfree air to outdoors

New Filter Wall System Boosts Spray Painting Production

BY R. E. CRAVEN
Chief Engineer
Marion Metal Products Co.



TWO MAKEUP AIR HEATERS, one of which is shown above, feature dampers which admit outside air automatically when filter wall exhaust fans are put into operation

INSTALLED to meet the trend toward larger trailer hauling units, a new paint filter wall has increased spray painting production on truck dump bodies by as much as 30 percent at Marion Metal Products Co., Marion, Ohio.

The new filter wall greatly facilitates painting large trailer units and increases the number of small bodies that can be painted simultaneously as well. Now, large trailer units can be painted *after* being assembled, eliminating the need for touch-up. Previously, this was not possible, as the bodies had to be painted separately and then mounted.

The wall, 35 ft long and standing 10 ft high, is made up of three connected sections, each containing two banks of 35 removable, disposable filters. Replacement of filters is made only at infrequent intervals at which time the paint-laden elements are discarded.

Each of the three units is equipped with a separate, belt driven tubeaxial fan with a capacity of 22,870 cfm at ⅜ in. water gage. Independent operation of the fans is possible when small work is painted.

With an air flow volume through the filters of 275 cfm per sq ft, all air exhausted to the outdoors is completely free of paint spray. These paint overspray filters meet the requirements and recommendations of the National Fire Protection Association Pamphlet No. 33 on spray finishing.

Since a total air flow of 68,610 cfm is exhausted when all three fans are operating, it was necessary to install two direct fired makeup air units, each rated 2 million Btu per hr. These heaters are installed on the opposite wall from the filter wall, nearly 200 ft away, and are arranged with automatic dampers to admit outside air when the fans are started. With these units, the outside air temperature can be raised from zero to 70 F.

During summer, when windows and doors are open, the makeup air units are not operated. ‡

Fan Performance Dimensional Analysis Leads to New Rating Method

• An accurate and expedient method of computing rating tables for axial flow and centrifugal fans has recently been developed. Making use of a digital computer, the procedure insures an accuracy of ± 1 percent. The author reviews the fundamentals of air flow and fan performance and explains how this new procedure can be used to determine fan ratings for larger fans than those for which test data is available.

Mr. Neelley, a registered professional engineer, is a 1951 mechanical engineering graduate of Texas A & M. After serving as an air electronics officer in the U. S. Air Force, he joined Owens, Pewthers Mfg. Corp. as plant engineer in 1954. He became associated with the Texas Engineering Experiment Station as a research assistant in 1956 and, last year, was named supervisor of its fan testing laboratory.

BY CHARLES E. NEELLEY
Head, Fan Testing Laboratory
Texas Engineering Experiment Station

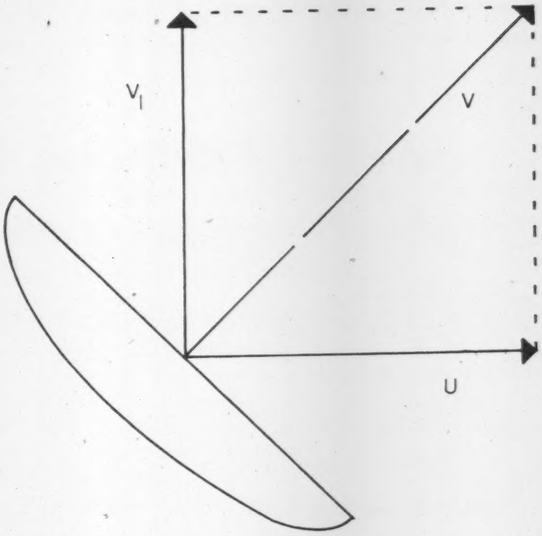
THE FLOW OF AIR through fans differs from positive displacement machinery in that the rate of flow is not definitely prescribed by the speed of the fan. The fan speed and rate of fluid flow can change independently of each other, and the performance of a fan therefore depends upon these two operating characteristics. In fact, the performance of a fan of given design, handling a fluid of fixed density and viscosity, depends only on two independent operating characteristics. Any two of the performance variables determines the operation of the fan and thereby sets the other variables.

If, for instance, the fan speed and rate of fluid flow for a given fan and a given fluid have specific values, then the flow inside the fan can have only one definite characteristic based on steady flow conditions. This means that all pressure differences and air moving losses in the machine have specific values. More specifically, if the speed and rate of flow are given, then a given fan can operate with the same fluid only under one head with one specific efficiency. All other operating characteristics, such as air horsepower and shaft horsepower, are established also.

Therefore, it is seen that the four variables (speed, rate of flow, pressure, and efficiency) which are sufficient to describe the performance of an air moving device are not physically independent of each other in a given unit. If two are given, then the other two have specific values determined by the particular geometry of the fan and the physical properties of the fluid. The performance of the fan under these prescribed conditions is characteristic for that particular fan or for its particular design. Any two fans or series of fans that are homologous have the same efficiency curve when plotted as efficiency *vs* percentage of free air delivery.

Analyze Fan Performance Dimensionally

The static pressure, H, and power, P, will depend upon the rate of fluid flow, Q, fan speed, N, and upon the properties of the fluid, i.e., density, ρ, and viscosity, μ. However, as the flow through a fan is essentially isothermal, the effect of viscosity will be neglected as it is essentially constant. Hence, the variables that affect the performance of air flow in fans are: rate of flow, Q; power, P; static pressure, H;



1 **VECTOR DIAGRAM of fluid flow through a fan illustrated at right. Peripheral velocity is indicated by *U*; fluid velocity is *V***

diameter of fan, D; fan speed, N; and fluid density, ρ. Listed below are these variables and their dimensions in the mass, length, and time system:

Q	H	P	D	N	ρ
L^3/θ	$M/L\theta^2$	ML^2/θ^3	L	$1/\theta$	M/L^3

By dimensional analysis, the proper grouping of these variables can be attained. In terms of Q, H, and P, the groups are:

$$Q/D^3N = (L^3/\theta)\ (1/L^3)\ (\theta/1) = K_1$$

or

$$K_1 = Q/D^3N \text{ (dimensionless)}$$

$$H/\rho D^2N^2 = (M/L\theta^2)\ (L^3/M)\ (1/L^2)\ (\theta^2/1) = K_2$$

or

$$K_2 = H/\rho D^2N^2 \text{ (dimensionless)}$$

$$P/\rho N^3D^5 = (ML^2/\theta^3)\ (L^3/M)\ (\theta^3/1)\ (1/L^5) = K_3$$

or

$$K_3 = P/\rho N^3D^5 \text{ (dimensionless)}$$

Thus, three basic dimensionless groups result that apply to all fans. Since these groups are dimensionless, they may be combined in various ways to secure new dimensionless groups. This was done in arriving at the four groups employed in making rating tables. These groups are:

$$K_3 = P/N^3D^5,$$
$$K_2 = H/D^2N^2,$$
$$K_4 = Q/D^2\sqrt{H},$$

and

$$K_5 = HQ/P$$

The quantity K_4, commonly known as the orifice ratio, is obtained by squaring K_1, dividing by K_2, and abstracting the square root of the quotient. K_5 is an efficiency, found by multiplying K_1 and K_2 and dividing by K_3. Note that these groups, with the exception of K_5, are no longer dimensionless. Density is assumed constant and therefore has been deleted.

In preparing fan rating tables, we are only interested in rating homologous units. Therefore the relationship of the above groups must be known when applied to homologous units. By homologous units we imply that the fluid flow passages in all units are geometrically similar. Further, the fluid flow passages will be considered similar if all fan dimensions are changed by the same ratio. Fluid flow conditions will be considered kinematically similar if all fluid velocities are changed by the same ratio and will have the same direction at similarly located points.

In the analysis to follow, the fluid is considered as incompressible, its other physical properties constant, and the flow will be considered one dimensional when passing through the fan.

From the statements above, and from consideration of a vector diagram of the fluid flow through a fan indicated in Fig. 1, it follows that a homologous unit requires a constant ratio between the fluid velocities and the peripheral velocities of the fan at all geometrically similar points of the machine compared. Designating the fluid velocity by V and the peripheral velocity of the fan by U, this condition can be expressed as

$$V/U = \text{constant} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [1]$$

Since the air flow at the fan inlet is considered to be one dimensional, the relationship can be rewritten in terms of $Q = AV$ and $U = nD$, where n is fan speed in rpm.

$$(Q/\pi D^2)/\pi Dn \longrightarrow Q/nD^3 = \quad \text{constant} \ldots\ldots\ldots\ldots [2]$$

Again employing the above discussion, the general energy equation can be reduced to:

$$(H_1/\rho) + (V_1^2/2gc) + (H_2/\rho) + (V_2^2/2gc) + \text{work}$$

or

$$H_1 - H_2 = [(V_2^2 - V_1^2)/2gc]\ \rho + \rho\ \text{work}$$

Since work is considered constant, this equation may be rewritten as:

$$(H_1 - H_2) - (P_{V2} - P_{V1}) = \text{constant}$$

or

$$P_V/H = \text{constant}$$

From the definition of $V = \sqrt{2gPv}$, we may write:

$$[(V_1^2/2gPv_1)\quad(Pv_1/H_1)/(V_2^2/2gPv_2)\quad(Pv_2/H_2)] = (V_1^2/2gH_1)/(V_2^2/2gH_2) = \text{constant}$$

or

$$V^2/2gH = \text{constant} \quad \ldots\ldots\ldots\ldots [3]$$

and from Equation 1:

$$2gH/u^2 \longrightarrow \quad 2gH/\pi^2 D^2 N^2 \longrightarrow H/D^2N^2 = \text{constant} \quad \ldots\ldots\ldots\ldots [4]$$

Therefore, according to Equation 2:

$$Q_1/Q_2 = N_1D_1^3/N_2D_2^3 = \text{constant} \quad \ldots\ldots\ldots\ldots [5]$$

according to Equation 6:

$$H_1/H_2 = D_1^2N_1^2/D_2^2N_2^2 = \text{constant} \quad \ldots\ldots\ldots [6]$$

Hence:

$$AHP_1/AHP_2 = KQ_1H_1/KQ_2H_2 = N_1^3D_1^5/N_2^3D_2^5 = \text{constant} \quad \ldots\ldots\ldots\ldots [7]$$

All losses are assumed to be proportional according to the definition of similitude. The ratio of the *SHP* must be constant and, therefore, the efficiency must be constant for all changes that follow Equation 1. Hence:

$$SHP_1/SHP_2 = N_1^3D_1^5/N_2^3D_2^5 = \text{constant}$$

Therefore, considering Equations 5, 6, and 8 at constant diameter, these equations become:

$$Q_1/Q_2 = N_1/N_2 \quad \ldots\ldots\ldots\ldots [9]$$

$$H_1/H_2 = (N_1/N_2)^2 \quad \ldots\ldots\ldots\ldots [10]$$

$$SHP_1/SHP_2 = (N_1/N_2)^3 \quad \ldots\ldots\ldots\ldots [11]$$

which are the fan laws employed in normal practice to predict the performance of a given fan when the speed is changed.

From this analysis, it is seen that the three dimensionless groups arrived at through dimensional analysis are constant when considered at a given point and can be used independently in computing rating tables of homologous units. The groups may be combined to produce constants other than the four employed in the development of this method for developing fan rating tables.

How Rating Tables Are Prepared

In preparing rating tables, there must be an actual test to establish the original data. Also, in accordance with the Standard Test Code for Centrifugal and Axial Fans, National Association of Fan Manufacturers, Inc., Fourth Edition, 1949, rating tables can only be prepared for fans larger than the fan tested.

From the original test data, curves are plotted of *H* and *P vs Q*. These curves are assumed to be the actual fan performance curves containing no error. From these curves, values of *Q*, *H*, and *P* are read at small intervals. These intervals are sufficiently small so that when the computed values of K_5 and K_7 are plotted *vs* K_4, a straight line drawn between any two points will closely approximate the best smooth curve that can be drawn through all points of each plot.

Basically two types of rating tables are desired. The first is one in which values of *Q* and *H* are specified and values of *N* and *P* are desired. In the second, values of *H* and *P* are specified and values of *Q* and *N* are desired. In the first type, where *Q* and *H* are specified and *H* and *P* are desired, the following steps are followed:

1) Compute values of K_4, K_5, and K_7 from original test data.

2) Compute K_4 for specified values of *Q* and *H*.

3) Knowing K_4, go to Step 1 and, by interpolation, find values of K_5 and K_7.

4) Knowing K_5, *Q*, and *H*, solve for *P*.

5) Knowing K_7 and *D*, solve for *N*.

6) Repeat for as many values of *Q*, *H*, and *D* as specified.

In the second type of rating table, where *H* and *P* are specified and *Q* and *N* are desired, these steps will be followed:

1) Compute values of K_4, K_5, K_6, and K_7 from the original data.

2) From Step 1, choose the value of K_6 corresponding to the point of maximum *P*.

3) With K_6 known, and *P* and *D* specified, solve for *N*.

4) With *N* known, and *H* specified, compute K_7.

5) Knowing K_7, go to Step 1 and, by interpolation, find K_4 and K_5.

6) Knowing K_4 and with *H* and *D* specified, solve for *Q*.

7) With K_5 and with *Q* known and *H* specified, solve for *P*. (For different values of *H* with the same sized motor, the speed will remain the same as found in Step 3.)

8) With *N* known and *H* specified, compute K_7.

9) Knowing K_7, go to Step 1 and, by interpolation, find K_4 and K_5.

10) Knowing K_4 and with *H* and *D* specified, solve for *Q*.

11) Knowing K_5, *H*, and *Q*, solve for *P*.

12) Repeat for as many values of *H*, *P*, and *D* as specified.

The fan speed, *N*, as solved for in Step 3 of the second type of rating table, is the speed at which this particular fan can operate for all values of *H* and not overload the motor specified. It does not mean that the fan will require the specified horsepower at all values of *H*.

The accuracy of this method is based on the difference between describing the values of K_4, K_5, and K_7, with the best smooth curves that can be drawn, and describing these values with straight lines. In the procedure used by the Texas Engineering Experiment Station, points are taken at intervals sufficiently small to insure an accuracy of at least ±1 percent. ‡

2nd Southwest Exposition and ASHRAE Meeting Open 1960 Heating and Air Conditioning Season

Products display and technical sessions will highlight growth of heating and air conditioning industry

THE 2nd Southwest Heating and Air Conditioning Exposition and the semi-annual meeting of the American Society of Heating, Refrigerating and Air-Conditioning Engineers opens in Dallas on Monday, February 1. The show will run Monday through Thursday, from noon until 10 p.m. The society meeting also ends on Thursday. Technical sessions will be held in the morning only, starting at 9:30 a.m. and terminating at 11:45 a.m.

The exposition will be held at Memorial Auditorium. The headquarters for the society will be the Baker Hotel.

This is the first exposition held under the auspices of the society in Dallas since the combined exposition and annual meeting were held there in 1950. There will be approximately 200 exhibitors showing their latest products covering the heating, refrigeration, air conditioning, ventilating, and evaporative cooling fields.

Early arrivals can register on Sunday any time after 10 a.m. Registration for the society meeting is an automatic registration for the exposition.

Subjects scheduled for coverage at the technical session will deal with absorption refrigeration, heating, thermoelectric refrigeration, sound control, heat transfer, use of plastics on domestic refrigerators, commercial refrigeration, fenestration, window air conditioning units, and automotive air conditioning.

At the exposition heat pumps will be featured by several exhibitors, along with both remote and self-contained air conditioning units. One exhibitor will introduce several completely new models of air conditioners and heat pumps, as well as a new line of compact forced air furnaces. Another, specializing in residential and light commercial refrigerated air conditioning is offering a remote condenser unit designed to provide high economy at high ambient temperatures. A manufacturer of 2 to 10 ton remote air conditioners and heat pumps, recommends water cooled condensing units because of high capacity and low operating cost.

There will be a packaged 50 ton air conditioning unit with a built-in evaporative condenser, which may be installed inside a building as a self-contained unit, or set up independently, completely exposed, but requiring no covering.

A new line of unit heaters and a new approach to the design of cooling condensers are to be offered in one display. A line of packaged liquid chillers with optional condenser units will be offered in another in sizes up to 125 tons. A 50 year old manufacturer offering high pressure air handling units will show a miniature air conditioning system in operation.

These and many other products will be featured during the four day exposition.

Show Hours

12 noon to 10 p.m.
Monday through Thursday
February 1-4, 1960

Technical Program

Monday, Feb. 1

Frost Formation on Coils, Heat Exchangers.

Tuesday, Feb. 2

Air Conditioning Symposium, Noise Reduction, Chimney Performance, Steam Flow in Copper Tubing, Forums on Industrial Ventilation, Air Cooled Condensers, Piping and Pickup Factors.

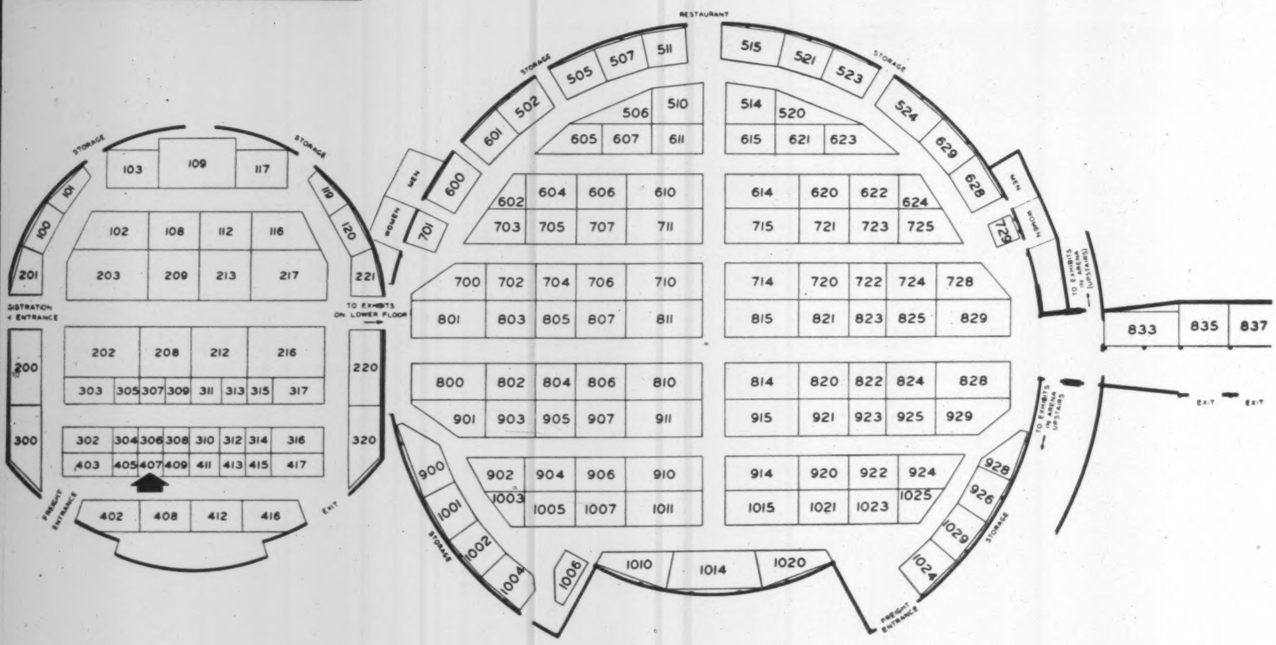
Wednesday, Feb. 3

Psychrometric Chart Symposium, Solar Heat Gain, Compressor Characteristics.

Thursday, Feb. 4

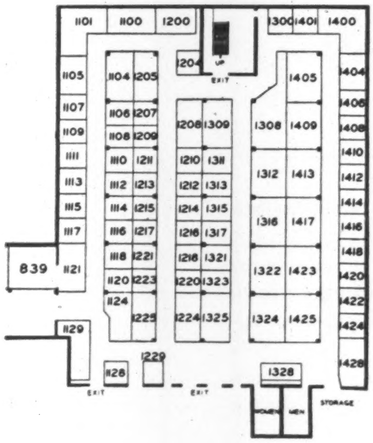
Summer Weather Data, Proposed Humidity Standard, Fenestration Symposium with reference to heating and air conditioning.

Floor Plan of the Exposition


RESTAURANT
STORAGE
STORAGE
103 109 117
101
100
119
120
102 108 112 116
201 203 209 213 217 221
REGISTRATION & ENTRANCE
TO EXHIBITS ON LOWER FLOOR
200
202 208 212 216
220
303 305 307 309 311 313 315 317
300
302 304 306 308 310 312 314 316
320
403 405 407 409 411 413 415 417
FREIGHT ENTRANCE
402 408 412 416
EXIT
STORAGE
505 507 511
515 521 523
STORAGE
601 502
506 510
514 520
524 629 628
605 607 611
615 621 623
MEN
600
WOMEN
701
602 604 606 610
703 705 707 711
614 620 622 624
715 721 723 725
MEN
WOMEN
729
TO EXHIBITS IN ARENA (UPSTAIRS)
700 702 704 706 710
801 803 805 807 811
714 720 722 724 728
815 821 823 825 829
833 835 837
800 802 804 806 810
901 903 905 907 911
814 820 822 824 828
915 921 923 925 929
TO EXHIBITS IN ARENA UPSTAIRS
EXIT
EXIT
900
1001
1002
1004
STORAGE
902 904 906 910
1003 1005 1007 1011
914 920 922 924
1015 1021 1023 1025
928
926
1029
1024
STORAGE
1006
1010 1014 1020
FREIGHT ENTRANCE

THE EXHIBITORS AND THEIR BOOTH NUMBERS

A. J. Mfg. Co.	**1100**
Acme Engineering & Mfg. Co.	**833**
Acme Industries, Inc.	**515, 521, 523**
AIMCO Products Corp., a Subsidiary of Yuba Consolidated Industries, Inc.	**728**
Air Conditioning Industries, Inc.	**1223**
Air-Con Filter Corp.	**1404**
Air Devices Inc.	**1110**
AirGuide Plastics Corp.	**605**
Airserco Mfg. Co., Inc.	**1120**
Ajax Boiler & Heater Co.	**835, 837, 839**
Alco Valve Co.	**906**
Allis-Chalmers Mfg. Co.	**200**
Alton Mfg. Co.	**403**
American Air Filter Co., Inc.	**524, 628, 629**
American Artisan	**407**
American Furnace Co.	**315, 317**
American Gas Association	**1005**
American Metal Mfg. Co.	**405**
American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.	**220**
American-Standard Industrial Div.	**907, 911**
AmeriVent, a Div. of American Metal Products Co., Inc.	**702**
Ammerman Co., Inc.	**221**
Anemostat-Waterloo	**102**
Ansul Chemical Co.	**117**
Arkla Air Conditioning Corp.	**910**
Armstrong Cork Co., Insulation Div.	**720**
Arrow-Hart & Hegeman Electric Co.	**1213**
Automatic Devices Co., Inc.	**101**
Auto-Flo Corp.	**1409**
Baltimore Aircoil Co., Inc.	**408, 412**
Barber-Colman Co., Air Distribution Products Div. and Automatic Controls Div.	**705, 707**
Bar-Brook Mfg. Co., Inc.	**902**
Barke Products, Inc.	**729**
Baso Inc.	**1418, 1420**
Bell & Gossett Co.	**416**
Bowman Co., Inc., D.F.	**1406**
Breidert Co., The G. C.	**835, 837, 839**
Bryant Mfg. Co., a Div. of Carrier Corp.	**1011**
Carnes Corp.	**208**
Carrier Corp.	**1010, 1014, 1020**
Chattanooga Royal Co.	**409, 411, 413, 415**
Chicago Blower Corp.	**1124, 1225**
Chrysler Corp., Airtemp Div.	**620, 622, 723**
Cleaver-Brooks Co.	**624**
Cobell Industries, Inc.	**806**
Coleman Co., Inc.	**801**
Congress Drives Div. of Tann Corp.	**621**
Continental Air Filters, Inc.	**835, 837, 839**
Controls Company of America	**822**
Cook Co., Loren	**103**
Coolerator Div., McGraw-Edison Co.	**800**
Copeland Refrigeration Corp.	**216**
Crane Co.	**202**
Curtis Mfg. Co., Refrigeration Div.	**320**
Dallas Power & Light Co.	**810**
Day & Night Mfg. Co.	**502, 601**
Detroit Controls Div. of American-Standard	**805**
Drayer-Hanson Div. of National-U. S. Radiator Corp	**1129**
Dryomatic Corp.	**1118**
Dunham-Bush, Inc.	**203, 209**
du Pont de Nemours & Co., E. I.	**1104, 1106**
Dura-Vent Corp.	**1015**
Duro Dyne Corp.	**1113**
Econo Products Co., Inc.	**606**
Edwards Engineering Corp.	**109**
Eggelhof Engineers Inc.	**1224**
Electro-Air Cleaner Co.	**835, 837, 839**
Emerson Electric Mfg. Co.	**1321**
Fairbanks Co., The	**1109**
Farr Co.	**829**
Fedders Corp.	**820**
Felter Co., John	**701**
Flanders Filters, Inc.	**1425**
Flexible Tubing Corp.	**305**
Fluor Products Co.	**300**
Fraser & Johnston Co.	**914**
Furnas Electric Co.	**722**
Gaffers & Sattler	**715**
Gannon Co.	**703**
General Chemical Div., Allied Chemical Corp.	**1324**



General Controls Co.	904
General Electric Co., Apparatus Sales Div.	1021
General Products Co., Inc.	309
Goodfellow Co., Inc.	611
Gordon & Piatt, Inc.	201
Greenheck Fan & Ventilator Corp.	1116
Gregory Industries, Inc.	1313, 1315, 1317
Gustin-Bacon Mfg. Co.	600
Halstead & Mitchell	926
Hanovia Lamp Div., Engelhard Industries, Inc.	1221
Hart & Cooley Mfg. Co.	1023
Heating, Piping & Air Conditioning	407
Henry Furnace Co.	217
Henry Valve Co.	312, 314
Holly-General Co.	520
Hubbell Corp.	1417
I.C.E.D., Inc.	1400
Ilg Electric Ventilating Co.	920, 922
Illinois Testing Laboratories, Inc.	1210, 1212
Industrial Acoustics Co., Inc.	1323
Industrial Combustion, Inc.	802
Ingersoll-Rand Co.	815
International Mfg. Co., Air Conditioning Div.	828
International Metal Products Sales Corp.	602, 604
Jackes-Evans Mfg. Co.	307
Janitrol Heating & Air Conditioning Div., Midland-Ross Corp.	714
Jenn Air Products Co., Inc.	623
Johns-Manville Sales Corp.	402
Johnson Service Co.	108, 112, 116
Joiner-Meads-Capers, Inc.	835, 837, 839
KSM Products, Inc.	1208
Keeney Publishing Co.	407
Korfund Co., The	835, 837, 839
Krueger Air Conditioning Co.	100
Lima Register Co.	1309
Lockformer Co., The	1205
Lone Star Gas Co.	1005
McDonnell & Miller, Inc.	804
McQuay, Inc.	212
Magic Aire Div., United Electric Co.	928
Major Controls Co.	823
Marley Co., The	814
Marlo Coil Co.	700
Metal Mfg. Co.	1111
Midland-Ross Corp., Janitrol Heating & Air Conditioning Div.	714
Milwaukee Electric Tool Corp.	1114
Mine Safety Appliances Co.	302
Minneapolis-Honeywell Regulator Co.	1024, 1029
Monogram Industries, Inc.	721
Morrison Products, Inc.	615
Mueller Brass Co.	1413
Mueller Climatrol Div. of Worthington Corp.	921, 923
Muellermist Irrigation Co., Fanjet Roof Cooling Div.	310
Multi-Vent Div. of Pyle National Co.	1121
Norman Products Co.	900
Northwest Foundry & Furnace Co.	1311
Olsen Mfg. Co., The	217
Omark Industries, Inc.	1405
Owens-Corning Fiberglas Corp.	821
Payne Co., The	903
Peerless Mfg. Div. of Dover Corp.	1015
Penn Controls, Inc.	724
Perfection Industries Div. of Hupp Corp.	901
Powder Tool Supply, Inc.	1405
Process Solvent Co., Inc.	1229
Randall Graphite Bearings, Inc.	304, 306
Raypak Co., Inc.	824
Ready-Power Co.	1007
Recold Corp.	119, 120
Reed Unit Fans, Inc.	1025
Refrigeration Research, Inc.	1423
Research Products Corp.	803
Revcor, Inc.	1414
Rheem Mfg. Co.	915
Rich Fan Mfg. Co., Inc.	1204
Ridge Tool Co., The	1004
Robertson Co.	704
Rotherm Engineering Co., Inc.	1003
Schemenauer Mfg. Co.	1424, 1428
Schnacke, Inc.	308
Smith Corp., A. O.	610
Southwest Mfg. Co.	614
Southwest Refrigeration Wholesalers Association, Inc.	1006
Sporlan Valve Co.	1001
Sprague Electric Co.	1128
Stewart-Warner Corp., Heating & Air Conditioning Div.	1325
Stoddard Industries, Inc.	1408
Texas Infra Red Radiant Co., Inc.	1101
Texas Products Mfg. Co.	607
Texas Refrigeration & Engineering Co.	1211
Thermac Co.	510
Thermal Engineering Corp.	213
Thermo-Pak Boilers, Inc.	1108
Titusville Iron Works Co., Div. of Struthers-Wells Corp.	1316
Torrington Mfg. Co.	303
Trane Co., The	505, 507, 511
Trerice Co., H. O.	1207
Trion, Inc.	1112
Tubenfin Coil Co., Inc.	1215, 1217
Tuttle & Co., H. W.	1401
Union Carbide Development Co., Div. of Union Carbide Corp.	1416
United Sheet Metal Co.	1002
United States Air Conditioning Corp.	905
United States Register Co.	316
Utility Fan Corp., Div. of Utility Appliance Corp.	711
Van-Packer Co., Div. of The Flintkote Co.	1200
Ventco, Inc.	1204
Vibration Mountings, Inc.	506
Viking Air Products Div. of National-U. S. Radiator Corp.	311
Vilter Mfg. Co., The	1105
Wallace Co.	313
Ward Co.	1115, 1117
Warren Register & Grille, Inc.	1107
Waterloo Register Co.	102
Western Supply Co.	1214, 1216
Westinghouse Electric Corp.	825
Westinghouse Electric Corp., Air Conditioning Div.	514
Wheeling Trueing Tool Co.	1410, 1412
White-Rodgers Co.	1308
Wiegand Co., Edwin	1115, 1117
Wiggin Products Co.	924
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co.	1218, 1220
Worthington Corp.	925, 929
Yeats Appliance Dolly Sales, Inc.	417
York Corp.	706, 710, 807, 811
Yuba Consolidated Industries, Inc.	725

Products on Display

While attending the 2nd Southwest Heating and Air Conditioning Exposition you will want to get the most out of the time you spend there. To assist you in seeing the equipment of specific interest, this show section has been compiled with the cooperation of exhibitors and by the show management. Information is as complete as possible as of press time.

To use this directory of exhibited products, look under the heading describing the product and circle the manufacturer's booth on the floor plan shown on pages 216 and 217.

For additional information, visit Keeney Publishing Co.'s booth, No. 407.

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Trane Co., The	505-507-511
York Corp., Sub. of Borg Warner	706-710-807-811

Air Conditioning Units and Components, Residential

AIMCO Products Corp., a Sub. of Yuba Consolidated Industries, Inc.	728
American Furnace Co.	315-317
Bar Brook Mfg. Co. Inc.	902
Carrier Corp.	1010-1014-1020
Chattanooga Royal Co.	409-411-413-415
Chrysler Corp., Airtemp Div.	620-622-723
Cobell Industries Inc.	806
Copeland Refrigeration Corp.	216
Curtis Mfg. Co.	320
Dallas Power & Light Co.	810
Day & Night Mfg. Co.	502-601
Drayer-Hanson, Div. National-U.S. Radiator Corp.	738
Dunham-Bush, Inc.	203-209
Fraser & Johnston Co.	914
Gaffers & Sattler	715
International Mfg. Co.	828
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.	714
Mueller Climatrol, a Div. of Worthington Corp.	921-923
Olsen Mfg. Co., The C. A.	217
Payne Co., The	903
Perfection Industries	901
Sequoia Mfg. Co.	1118
Southwest Mfg. Co.	614
Texas Products Mfg. Co.	607
Trane Co., The	505-507-511
United States Air Conditioning Corp.	905
Western Supply Co., Contract Mfg. Div.	1214-1216
York Corp., Sub. of Borg-Warner	706-710-807-811

Air Conditioning Units and Components, Commercial-Industrial

Alton Mfg. Co.	403
Carrier Corp.	1010-1014-1020
Worthington Corp.	921-923-925-929
York Corp., Sub. of Borg-Warner	706-710-807-811

Air Handling Units (Commercial-Industrial)

Air Conditioning Industries, Inc.	1223
Drayer-Hanson, Div. National-U.S. Radiator Corp.	738
Dunham-Bush, Inc.	203-209
Halstead & Mitchell	926
Magic Aire Div., United Electric Co.	928
Marlo Coil Co.	700
Recold Corp.	119-120
Texas Refrigeration & Engineering Co.	1211
Torrington Mfg. Co., The	303
Tubenfin Coil Co., Inc.	1215-1217

Air Mixing Units

Barber-Colman Co.	707

Bases and Mountings

Congress Drives, Div. Tann Corp.	621
Randall Graphite Bearing, Inc.	304-306
Vibration Mountings Inc.	506

Bearings and Bushings

Randall Graphite Bearings, Inc.	304-306

Belts

Barke Products Inc.	729
Congress Drives, Div. Tann Corp.	621

Blowers, Centrifugal

Ilg Electric Ventilating Co.	920-922
Morrison Products, Inc.	615
Utility Fan Corp.	711
Viking Air Products	311

Blower Wheels

Torrington Mfg. Co., The	303

Boilers

Cleaver-Brooks Co.	624
Edwards Engineering Corp.	109
Eggelhof Engineers Inc.	1224
Industrial Combustion Inc.	802

Burners, Gas and Oil

Gordon & Piatt, Inc.	201

Chimneys, Prefabricated

Van-Packer Co., Div. of the Flintkote Co.	1200
Wallace Co., William, Metalbestos Div.	313

Coils, Heating or Cooling

Dunham-Bush, Inc.	203-209
Magic Aire Div., United Electric Co.	928
Marlo Coil Co.	700
Schemenauer Mfg. Co.	1424-1428
Trane Co., The	505-507-511
Tubenfin Coil Co., Inc.	1215-1217

Condensers, Refrigerating

AIMCO Products Corp., a Sub. of Yuba Consolidated Industries, Inc.	728
Air Conditioning Industries, Inc.	1223
Alton Mfg. Co.	403

Baltimore Aircoil Co., Inc.	408-412
Drayer-Hanson, Div. National-U.S. Radiator Corp.	738
Dunham-Bush, Inc.	203-209
Goodfellow Co., Inc., E. D.	611
Halstead & Mitchell	926
Magic Aire Div., United Electric Co.	928
Marlo Coil Co.	700
Recold Corp.	119-120
Tubenfin Coil Co., Inc.	1215-1217
Yuba Consolidated Industries, Inc.	725-728

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Schnacke, Inc.	308
Trane Co., The	505-507-511
Worthington Corp.	921-923-925-929

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General Controls Co.	904
Gordon & Piatt, Inc.	201
Johnson Service Co.	108-112-116

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Automatic Devices Div., American Machine and Metals, Inc.	101
Baso Inc.	1418-1420
Controls Co. of America	822
Detroit Controls Div. of American-Standard	805
General Controls Co.	904
International Mfg. Co.	828
Johnson Service Co.	108-112-116
Penn Controls, Inc.	724
Vilter Mfg. Co., The	1105
White-Rodgers Co.	1308

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Carrier Corp.	1010-1014-1020
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Goodfellow Co., Inc., E. D.	611
Marley Co., The	814
Schnacke, Inc.	308

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Air Guide Plastics Corp.	605
Barber-Colman Co.	707
Econo Products Co., Inc.	606
Morrison Products, Inc.	615

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Duct Systems

Gustin-Bacon Mfg. Co.	600
United Sheet Metal Co., Inc.	1002
Viking Air Products	311

Duct Tape

Duro Dyne Corp.	1113

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Ilg Electric Ventilating Co.	920-922
Wiegand Co., Edwin L., L. R. Ward Co.	1115-1117

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American Air Filter Co., Inc.	524-628-629
Chrysler Corp., Airtemp Div.	620-622-723
Electro-air Cleaner Co., Inc.	835-837-839
Trion Inc.	1112

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Bell & Gossett Co.	416

Evaporative Cooler Media

Research Products Corp.	803

Evaporative Coolers

Farr Co.	829
Gaffers & Sattler	715
International Metal Products Co.	602-604

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Rotherm Engineering Co., Inc.	1003
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Yuba Consolidated Industries, Inc.	725-728

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Acme Engineering & Mfg. Corp.	833
Bar Brook Mfg. Co. Inc.	902
Rich Fan Mfg. Co., Phil	1204

Fans, Propeller

Ilg Electric Ventilating Co.	920-922
Reed Unit Fans, Inc.	1025

Filter Coatings

Research Products Corp.	803

Filter Gages

Econo Products Co., Inc.	606

Filters

American Air Filter Co., Inc.	524-628-629
Farr Co.	829
Flanders Filters, Inc.	1425
Mine Safety Appliances Co.	302
Research Products Corp.	803
Viking Air Products	311

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Duro Dyne Corp.	1113

Flexible Ducts

Flexible Tubing Corp.	305

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Chrysler Corp., Airtemp Div.	620-622-723
Cobell Industries Inc.	806
Coleman Co.	801
Fraser & Johnston Co.	914
Day & Night Mfg. Co.	502-601
Gaffers & Sattler	715
Monogram Industries, Inc.	721
Mueller Climatrol, Div. of Worthington Corp.	921-923
Northwest Foundry & Furnace Co.	1311
Olsen Mfg. Co., The C. A.	217
Payne Co., The	903
Peerless Mfg. Div., Dover Corp. and Dura-Vent Corp.	1015
Perfection Industries	901
Sequoia Mfg. Co.	1118
Southwest Mfg. Co.	614
Texas Products Mfg. Co.	607
Trane Co., The	505-507-511

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Arkla Air Conditioning Corp.	910
Cobell Industries Inc.	806

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Hart & Cooley Mfg. Co.	1023
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Van-Packer Co., Div. of the Flintkote Co.	1200
Wallace Co., William, Metalbestos Div.	313

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Milwaukee Electric Tool Corp.	1114

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Fairbanks Co., The	1109
Yeats Appliance Dolly Sales Co.	417

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Duro Dyne Corp.	1113

Hardware, Duct and Damper

Duro Dyne Corp.	1113

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Yuba Consolidated Industries, Inc.	725-728

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Felter Co., John	701

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Morrison Products, Inc.	615

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Research Products Corp.	803

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Texas Infra Red Radiant Co., Inc.	1101
Wiggin Products Co., Inc.	924

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Armstrong Cork Co.	720
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Johns-Manville Sales Corp.	402

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Duro Dyne Corp.	1113

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Controls Co. of America	822
Westinghouse Electric Corp.	825

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Allis-Chalmers Mfg. Co.	200
Arrow-Hart & Hegeman Electric Co.	1213
General Controls Co.	904
Westinghouse Electric Corp.	825

Pilot Valves

Baso Inc.	1418-1420

Pipe and Fittings, Duct System

American Metal Mfg. Co.	405

Pipe and Fittings, Fluid System

Fairbanks Co., The	1109

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Barke Products Inc.	729
Congress Drives, Div. Tann Corp.	621

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Allis-Chalmers Mfg. Co.	200
Bell & Gossett Co.	416
Dunham-Bush, Inc.	203-209
Goodfellow Co., Inc., E. D.	611
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Dunham-Bush, Inc.	203-209
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Schemenauer Mfg. Co.	1424-1428
Trane Co., The	505-507-511

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du Pont de Nemours & Co., E. I.	1104-1106
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Ansul Chemical Co.	117
Controls Co. of America	822
Detroit Controls Div. of American-Standard	805
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Recold Corp.	119-120
Sporlan Valve Co.	1001

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Anemostat-Waterloo	102
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Metal Mfg. Co.	1111
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Cook Co., Loren	103
Felter Co., John	701
Greenheck Fan & Ventilator Corp.	1116
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Jenn Air Products Co., Inc.	623
Reed Unit Fans, Inc.	1025
Trane Co., The	505-507-511

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Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.	714
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Bar Brook Mfg. Co. Inc.	902
Rich Fan Mfg. Co., Phil	1204
United States Register Co.	316

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General Controls Co.	904

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McDonnell & Miller Inc.	804

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Duro Dyne Corp.	1113
Milwaukee Electric Tool Corp.	1114
Ridge Tool Co., The	1004

Tools, Pipe Cutting

Ridge Tool Co., The	1004

Tools, Powder Actuated

Omark Industries, Inc.	1405

Tools, Refrigeration

Ansul Chemical Co.	117
Henry Valve Co.	312-314

Unit Heaters, Direct-Fired

Arkla Air Conditioning Corp.	910
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.	714
Day & Night Mfg. Co.	502-601
Norman Products Co.	900
Olsen Mfg. Co., The C. A.	217
Trane Co., The	505-507-511
Wing Mfg. Co., L.J., Div. of Aero Supply & Mfg. Co. Inc.	1218-1220

Unit Heaters, Steam or Hot Water

Dunham-Bush, Inc.	203-209
Ilg Electric Ventilating Co.	920-922
Peerless Mfg. Div., Dover Corp. and Dura-Vent Corp.	1015
Wing Mfg. Co., L.J., Div. of Aero Supply Mfg. Co. Inc.	1218-1220

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Major Controls Co.	823

Valves, Steam and Water

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Fairbanks Co., The	1109
General Controls Co.	904

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Chrysler Corp., Airtemp Div.	620-622-723
Curtis Mfg. Co.	320
Dunham-Bush, Inc.	203-209
Schnacke, Inc.	308
Vilter Mfg. Co., The	1105
Western Supply Co., Contract Mfg. Div.	1214-1216
Worthington Corp.	921-923-925-929
York Corp., Sub. of Borg-Warner	706-710-807-811

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Coleman Co.	801
Gaffers & Sattler	715

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McDonnell & Miller Inc.	804

Welders

Duro Dyne Corp.	1113
KSM Products, Inc.	1208
Omark Industries, Inc.	1405

HPAC ENGINEERING DATA FILE

What to Consider When Designing High Temperature Hot Water Heating Systems

- *When it is used*
- *Ways to generate HTHW*
- *How expansion drums function*
- *Methods of pressurizing system*
- *Selecting the circulating pumps*
- *Designing the piping system*

High temperature hot water heating systems are finding wider application as experience is gained with installations in various district heating applications. Impetus for its use in this country — while it had been used in Europe for many years — has been aided by the U. S. Air Force decision to employ HTHW at bases both here and overseas. A variety of installations have been made in recent years in air terminals, shopping centers, universities, and industrial plants where its favorable characteristics can be utilized to advantage. More recently some engineers have found it suitable for smaller installations such as in schools and hospitals.

As in all engineering solutions, a number of different approaches can be taken to arrive at a successful HTHW system design. In this report, the experience of a number of engineers who have been designing these systems was called upon to obtain current thinking on the various aspects of the subject. Among the topics included are methods of generating HTHW, selection of boilers, expansion drum design and methods of pressurization to prevent flashing of the HTHW to steam, considerations in selecting pumps for HTHW service, and some points to consider in the design of distribution piping systems.

The editors are indebted to the following engineers who cooperated in the preparation of the information presented herein:

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The information provided by each is indicated in the list of references.

Designing the High Temperature Hot Water Heating System

HOT WATER heating systems employing water at high temperatures and high pressures are being used with increasing frequency in schools, hospitals, etc. These systems are commonly associated with large district heating installations — military bases, shopping centers, airports, etc. — because of their characteristics favorable to such applications. While the district heating application has been most common in the U. S. in the past, the basic advantages of the system and improvements in the art in recent years make its use in smaller plants both feasible and attractive in many situations.

The increase in number of decisions to use high temperature hot water (HTHW) in installations of total capacity of less than 10 million and down to 1 or 2 million Btu per hr is revealed by a review of the new installations for which one manufacturer supplied the HTHW boilers during the past several years. In 1952 and 1953, all of the jobs had total capacities greater than 20 million Btu per hr. In 1958 and 1959, about half of the jobs had total capacities less than 10 million Btu per hr. While the exact percentage of system capacities in a certain range may not be the same in all cases, this information serves to indicate the trend to increased usage in smaller installations.

HTHW? — HTW? — HPHW?

Considerable discussion has taken place as to the term which best describes a hot water heating system employing water at temperatures above the boiling point at atmospheric pressure. The term high temperature hot water (HTHW) — which is used in these pages — evolved when the need was felt for differentiating between conventional hot water systems and those which had to be pressurized to prevent boiling. After some considerable period of usage, many engineers felt the word "hot" was superfluous since the term high temperature water naturally conveys the impression that the water is hot. Accordingly these systems are often referred to as high temperature water (HTW) systems.

Others who feel that the pressurization required to prevent steaming is also a necessary part of the description have suggested and use high pressure hot water (HPHW) as a better term to describe these systems. In England, the terms high, medium, and low pressure hot water are now in relatively common use indicating specific water temperature ranges.

Without becoming involved in a discussion of the pros and cons of each term, the terminology adopted earlier will be followed in this report. Thus, high temperature hot water (HTHW) will be used. In the field of "hot water heating" there is a wide range of temperatures to be considered, from 180 F leaving the hot water boiler — normally accepted as more or less standard for a gravity hot water heating system — to 400 F which is usually considered the upper practical limit for hot water heating. This range may be broken down into three temperature groups which are referred to as high temperature, medium temperature, and low temperature hot water. If the word "hot" is omitted, the designations become somewhat confusing, particularly in the case of "low temperature water," since the use of chilled water has become popular for summer cooling. "Low temperature water," to many people, would mean water that feels cold. The use of "hot" in describing the three ranges of temperature used makes it clear that the temperatures being considered are those that may be used for heating.

The temperature range from 180 to 400 F represents system pressures from atmospheric pressure for gravity systems having a vented expansion tank to 233 psig (saturation pressure). It is convenient to consider[1] this wide temperature range as three groups mentioned above. The limiting temperatures and, hence, pressures for these ranges are not fixed. The following limits are suggested for each range. The low temperature range is from 180 to 250 F. This is also the low pressure range with gauge readings from zero to 15 psig. The medium temperature range is from 250 to 300 F and the corresponding pressures range from 15 to 122 psig. The high temperature range includes temperatures from 300 to 400 F with pressures from 122 to 233 psig. Above 400 F, the pressure rises rapidly. For example, the saturation pressure for 450 F is 408 psig. Up to about 400 F, standard Schedule 40 pipe with 300 lb class fittings and valves can be safely used. It should be noted that 600 lb class fittings and valves, and extra heavy pipe are sometimes used at temperatures near 400 F where local conditions suggest their use. Above this temperature, the cost of boilers, pumps, and piping increases in a ratio too great to be offset by reduction in water quantities and consequent smaller piping. Thus, 400 F is generally considered the economic limit. In this report, the basic design considerations for only the HTHW systems (with temperatures from 300 to 400 F) will be considered though some of them are applicable to the MTHW systems, also.

When Should Use of HTHW be Considered?

The HTHW system has a number of inherent advantages that make it suitable for many different heating applications. These suggest the use of HTHW when:

- *the load will be extremely variable.* High thermal capacity permits the HTHW plant to absorb high peak loads without rapid load change reflecting immediately on the boiler firing rate. This allows steady firing with its advantages of higher operating efficiency.
- *mains are long and reduced pipe size will afford economic advantage both in cost of piping and the accessories such as valves, insulation, etc.* The HTHW system will require relatively smaller pipe sizes as compared with other systems. Small pipe sizes result from large temperature differentials that are used in high temperature hot water systems.
- *ground water table, ground contour, or other underground utilities would present problems.* The HTHW mains can be run dead level or arranged to pass above or below existing utilities, thus, simplifying the piping. The mains can be sloped in either the direction of flow or against the flow. It is desirable to slope the lines in one direction or another to permit complete drainage of the lines for maintenance and to avoid trapping or pocketing any water that could freeze should the lines be inoperative during freezing conditions.
- *process steam is needed at points remote from the central boiler plant.* HTHW can be used to generate medium pressure steam (10 to 50 psig) at the point of use.
- *a hot water system is suggested but it is desirable to reduce pump capacities.* Smaller flow rates associated with high temperature differentials permit an appreciable reduction in pump size for HTHW over that for LTHW.
- *low maintenance requirements and costs are desired.* The HTHW system has few auxiliaries requiring detailed maintenance and these usually are located in the central plant. Additionally,

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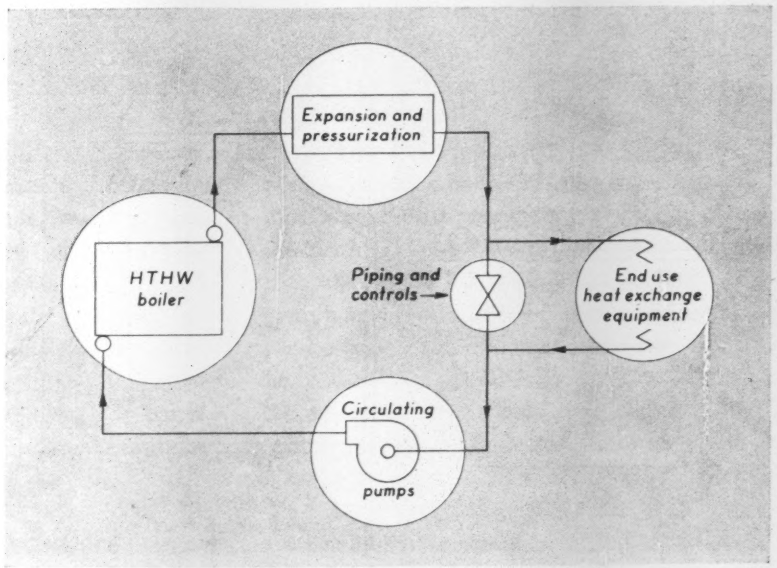
[1] *Numerals refer to references on page 240.*



1 FIVE BASIC COMPONENTS important in HTHW design are illustrated here

the system is operated in a chemically neutral condition — because makeup water is held to a minimum — and is non-corrosive. Because of this, the life expectancy of all components is materially increased.

- *high radiant heat losses to large glass areas associated with contemporary design must be controlled.* High temperature of heating medium when used directly in space decreases amount of heat transfer surface required and increases versatility of design since radiant energy can be directed to areas according to need.

Five Basic System Components

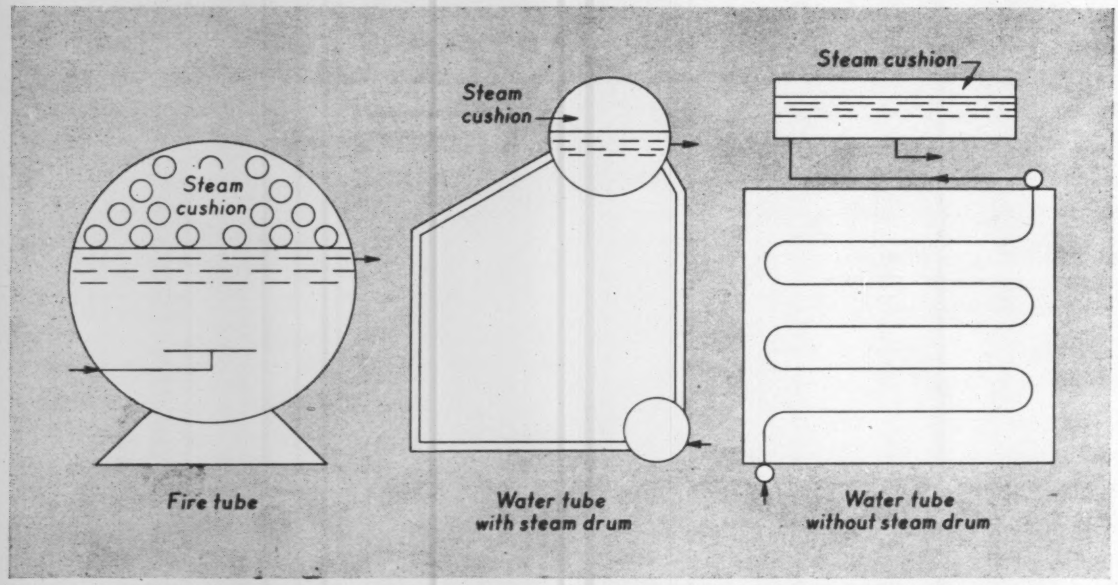
The HTHW system consists of five basic components, shown in Fig. 1, that differ little from those of the LTHW system. Some of these have been mentioned earlier and some are quite obvious. These are: the boiler or source of energy for the circulating water, the expansion drum and pressurization system which absorbs fluctuations in water volume and prevents formation of steam, the piping system with its accessories to carry the HTHW to the point of use and to control its flow, the pumps which circulate the HTHW, and the end use heat transfer surface that extracts heat from the circulating water and employs it to best advantage in comfort or process heating.

Each of these basic components is discussed individually, though in some cases the discussion of one must naturally embrace others. Emphasis is placed on points to consider when designing a high temperature hot water system.

Consider Various HTHW Boilers

Basically, there is little difference between steam boilers and those used to generate HTHW. Most types of steam boilers — designed for the required pressure — may be adapted for generation of HTHW. Both fire tube and water tube boilers have been used successfully.

When the system is steam pressurized[1], a steam cushion is maintained at saturation pressure and temperature above the controlled water level. The water line may be maintained



2 PROFILES OF THREE BOILERS used for generating HTHW are shown here. In steam pressurized systems, water line may be located as shown here, or in external expansion vessels in the case of fire tube boilers and water tube boilers with steam drums. Controlled forced circulation water tube boilers without drums are most common

either in the shell of fire tube boilers or in the stream drum of water tube boilers (Fig. 2). The steam space above the water line may be employed not only to furnish the necessary pressure to maintain the water temperature, but to provide for expansion and contraction of water in the entire distribution system. Instead of the usual practice of leading from the steam space, as when generating steam, water is drawn from a point below the water line and circulated by pumps through the piping system.

On large HTHW systems it is usually preferable to take up expansion and contraction in a separate expansion drum. Since the upper portion of the drum contains steam under pressure, this will perform the required pressurizing function and the steam space is not required in the boiler.

Fire Tube Boilers Serve Two Ways

Fire tube boilers, especially of the Scotch Marine (or internal furnace) type, which are commonly used as package steam generators, can be employed[2] for moderate sized HTHW systems. They may be operated submerged (completely filled with water) or with a steam space to act as an expansion drum. Thus, the boiler can serve the dual function of expansion and pressurization. The advantages of these boilers — compactness, economy, efficiency, and ample room on the water side for natural circulation — particularly lend them to this application.

One serious problem with the fire tube boiler is the danger of water that is too cold returning to the boiler causing thermal shock which may fracture the tube sheets. This should be prevented by installation of adequate water mixing connections which blend supply and return water to provide the desired admixture temperature entering the boiler. Another point to consider is the proper diffusion of the return water into the fire tube boiler to assure uniform temperatures throughout the length of the unit. Several types of boilers have perforated diffuser tubes incorporated in their bottoms to accomplish this equalization.

Water Tube Boilers Made for HTHW

Since expansion and pressurization are usually best accomplished[1] external to the boiler, the drumless water tube boiler of the controlled forced circulation type is especially suited for HTHW systems. They are commonly used and a number of different designs have been made specifically for HTHW. In boilers of this type designed for generating HTHW, screened orifices are installed at the entrance to each tube circuit so that water is metered to each tube in direct proportion to its heat absorbing capacity. The use of orifices permits variations in the tube arrangements and length, while retaining optimum water flow through each tube. The tube circuits are arranged to provide both radiant and convective heating surfaces resulting in high efficiency. The velocity of water through the tubes must be sufficient to prevent settling of sediment or gases within the tubes. Collection of either could result in tube failure. Circulation must be maintained within the limits of the boiler design at all times.

Thermal shock due to the return of cold water to the boiler should also be considered[3] in water tube boilers. This may damage the rolled tube and header joints and necessary precautions should be taken in design to prevent the return of cold water to the boiler.

One type of water tube boiler designed for HTHW service can have its convection surface mounted on top of the radiant surface. Or, the convection surface may be located behind the radiant surface to minimize headroom requirements in the boiler room.

Another type of water tube boiler — the "corner tube" boiler — can also have its convection surface either above or behind the radiant surface and, therefore, also has a low silhouette. Large down-comers in the corners of the boiler permit gravity circulation within the boiler, thus, providing self balancing of the flow through the tube circuits. The natural circulation tends to minimize the effects of pump or line failure on the boiler. Return water is preheated in the convection section, thus minimizing the possibility of thermal shock.

Cascade Heaters Supply HTHW

HTHW may also be generated[2] through the use of steam boilers and cascade heaters. Steam flows from the boiler to the cascade heater. In the heater, the steam is condensed by direct contact with the return HTHW which is sprayed into the top of the heater. The steam is thus condensed into HTHW and its latent heat of vaporization is used to raise the temperature of the HTHW return. The HTHW is drawn from beneath the water line of the cascade heater, through a mixing nozzle, into the circulating pumps. A part of the HTHW is recirculated to the boiler and the remainder is circulated through the heating system. Water treatment is relatively more important in these systems. Due to the continuous production of steam, solids which can be scale forming are concentrated and must be blown down periodically. Also, some parts of the system can be subjected to corrosive attack similar to that in condensate lines in steam systems. The latter is particularly true when the same boilers provide steam for both process heating and for generating HTHW.

Many types of HTHW boilers or modified steam boilers have been successfully used. The choice of a boiler for a particular job will depend upon headroom limitations, system size, method of pressurization, the number of boilers required to satisfy the load in the most economical fashion, and economic factors. The most common boiler in present use is the controlled forced circulation type designed specifically for generating HTHW. They are readily adapted to high temperature hot water system requirements.

Sizing the HTHW Boilers

In determining the size of hot water boilers when the connected load is expected to vary rapidly, consideration should be given to an important factor[1] peculiar to HTHW systems. That factor is the reserve heat available in the piping system. A comparison of heat stored in a cubic foot of hot water with that available from the same volume of steam will illustrate this thermal flywheel effect.

Condensation of one pound of steam at 175 psia yields 852.8 Btu but the volume occupied by this pound of steam at this pressure is 2.602 cu ft. Therefore, the heat given up by one cu ft is 852.6/2.602 = 327.6 Btu. One cu ft of water at the same temperature and pressure, if cooled through 100 F, from 371 to 271 F, will give up the difference in fluid heats at these temperatures. From steam tables, the enthalpy (heat content) of saturated liquid at 371 F, is 343.6 Btu per lb, and at 271 F, is 239.9 Btu per lb. The specific volumes are 0.01824 cu ft per lb, and 0.01718 cu ft per lb, respectively. The heat given up is, therefore, (343.6/0.01824) − (239.9/0.01718 = 4880 Btu per cu ft or almost 16 times the heat that steam will give up when condensing.

Since the average load over any 24 hr period is considerably less than the design load based upon the maximum temperature difference between inside and outdoors and because of the thermal storage inherent in HTHW, it has been found in practice[1] that 80 percent of the total heat load will provide adequate boiler capacity for the HTHW system. For example, if the connected load for a project is 21,000,000 Btu per hr, the boiler output needed will be 0.80 x 21,000,000 or 16,800,000 Btu per hr. To ensure flexibility, and in order that there will be a standby unit for overhaul, inspection, or repairs, standard practice would dictate the installation of two boilers, each with 2/3 the capacity calculated above: 2/3 × 16,800,000 or 11,200,000 Btu per hr. The total plant capacity is then 22,400,000 Btu per hr.

If this project had been designed for steam, the boilers would have been sized[1] for full continuous rating of 21,000 lb steam per hr. Taking the conventional standard, this would mean two boilers each rated at 2/3 the total load or 14,000 lb steam per hr. The total plant then would be 28,000 lb per hr, which is equivalent to 28,000,000 Btu per hr, an increase of 25 percent above that required for HTHW.

Consider Diversity Factors in Sizing

When it is anticipated that rapid load fluctuations will not be encountered, the reserve heat in the piping system will be of little benefit. Many systems[3] including space heating and industrial process loads seldom vary rapidly. A boiler capacity of only 80 percent of the total load would not be adequate if the total load was to extend over a considerable period of time.

However, in large systems serving a number of individual loads — an Air Force Base system for example — it is common practice[3] to use a diversity factor to arrive at adequate boiler capacity. For heating loads, a diversity factor of 80 percent of the individual loads is usually taken to determine plant capacity. For utility loads which are encountered for only brief periods of time, such as domestic hot water heating, process steam generation, etc., a diversity factor of 65 percent is used. If continuous or nearly continuous process loads are anticipated, 100 percent of these loads is figured in plant capacity. It should be noted that these same factors would be applicable to steam systems.

The most difficult factor to take into account, and one that should be considered, is future plant expansion. If possible, provision should be made for future needs.

Four Typical Boiler Flow Circuits

The boiler flow circuit depends upon the method of pressurization and the means for generating HTHW. Two methods of pressurization commonly used are the steam cushion and gas cushion methods. Other means such as elevated tanks and hydraulic pumps are available but rarely used.

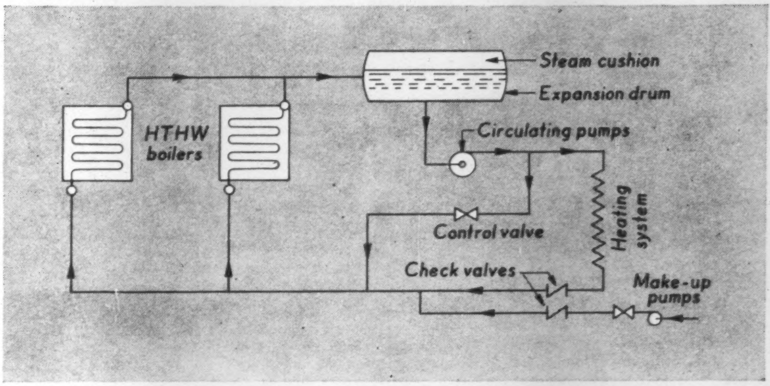
The generator flow circuits can then be resolved[4] to four basic arrangements:

1) Steam pressurized, single pump
2) Steam pressurized, dual pump
3) Inert gas (usually nitrogen) pressurized, single or dual pump
4) Cascade systems

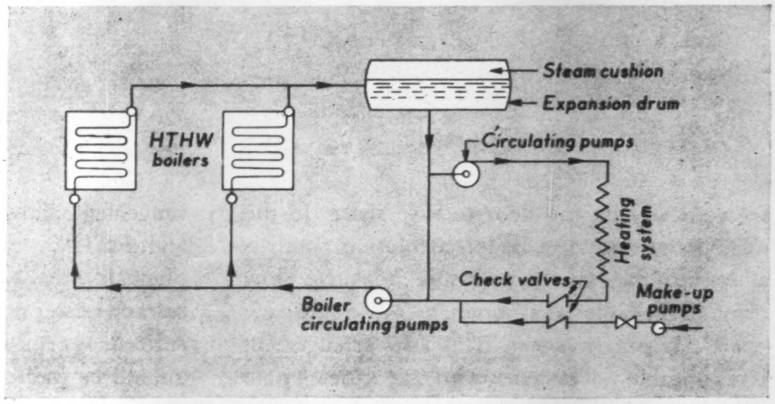
The selection of which method to use cannot be generalized and a complete study must be made of each application before a decision can be reached. However, some basic areas of application lend themselves more readily to one or the other methods, namely:

1) *Steam pressurized, single pump* — This method, illustrated in Fig. 3, finds most application in the installations of capacity up to 25,000,000 Btu per hr and where the circulation rate is fairly constant. However, the single pump system has been used in larger installations. To maintain circulation through the boiler at all times an automatic bypass control valve must be provided.

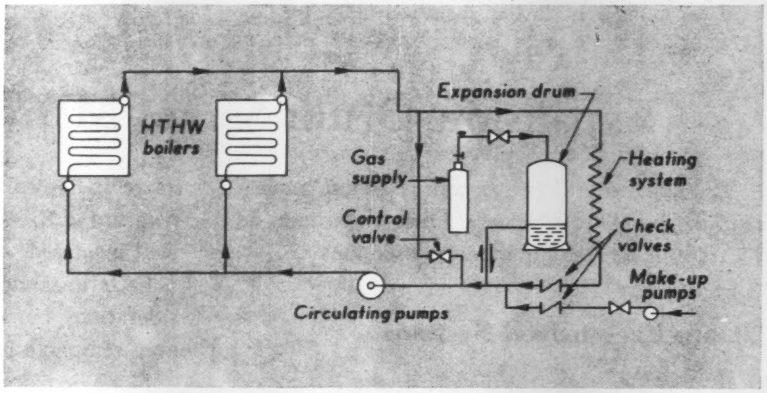
2) *Steam pressurized, dual pump* — This


Steam cushion
Expansion drum
HTHW boilers
Circulating pumps
Heating system
Control valve
Check valves
Make-up pumps

3 SINGLE PUMP, steam pressurized boiler flow circuit is one of several used in HTHW systems. Single pump must maintain proper flow through boiler while meeting system heat demand


Steam cushion
Expansion drum
HTHW boilers
Circulating pumps
Heating system
Check valves
Make-up pumps
Boiler circulating pumps

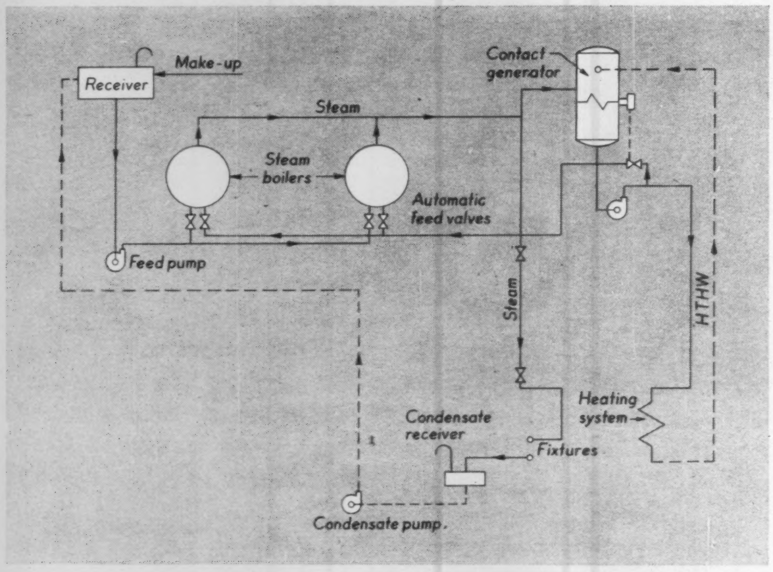
4 DUAL PUMP, steam pressurized boiler flow circuit uses separate pump to maintain adequate flow through boiler


Expansion drum
HTHW boilers
Gas supply
Heating system
Control valve
Check valves
Make-up pumps
Circulating pumps

5 GAS PRESSURIZED boiler flow circuit differs from steam pressurized system in that expansion tank and circulating pumps are in the return line. Separate pump is used when necessary to maintain proper flow through boiler

method, shown in Fig. 4, finds most application in large central heating installations of capacity 25,000,000 Btu per hr and larger. Circulation is assured through the boilers at all times irrespective of the flow through the system.

3) *Inert gas pressurized* — This flow arrangement, shown in Fig. 5, is similar to the steam pressurized single pump except for the location of the expansion vessel. The advantage of this method of pressurization is that a positive pressure cushion is always kept which is higher than the saturation pressure of the HTHW. The expansion drum is generally smaller, does not require insulation and may be



6 CASCADE SYSTEM flow circuit is shown here. HTHW is generated by contact between steam from boiler and return water. This system is especially suited to systems requiring both steam and HTHW

set vertically on the floor to save space. In the dual pump system, a boiler circulating pump is added to the circuit to assure adequate flow through the boiler at all times.

4) *Cascade system* — This flow arrangement is applicable to systems with capacities up to about 25,000,000 Btu per hr and where steam producing boilers are to be used. This system has also been used in larger installations. This arrangement, shown in Fig. 6, permits both steam and HTHW to be available from the boiler plant. It offers some flexibility in location of the cascade heater not available with the steam pressurized system in which the expansion drum should be located above the boiler and in close proximity to it. As mentioned earlier, proper water treatment is necessary with the cascade system.

Expansion Drum Serves Many Functions

The expansion drum or tank is a vital component of the HTHW system. Dependent upon its location, it serves[4] a number of functions.

Steam Pressurized Systems

In a steam pressurized system, the expansion drum functions[4] as an accumulator or surge tank to absorb the changes in water volume in the system, and as a separator to permit the separation of the steam and water mixture leaving the boilers. It also serves as a suction reservoir for the system and boiler circulating pumps, and as a manifold to integrate all of the boilers and circulating pumps. Since most of the circulating water passes through the drum in these systems, its temperature approaches the maximum temperature in the system and, therefore, it must be well insulated.

Each installation has its special design considerations, but all share in common that a fairly even temperature should be maintained throughout the expansion drum to avoid differential stress or strain due to temperature difference in the various drum elements. Also, the vessel should have adequate volume to accomplish its purpose and, the piping and level controls should be simple.

For small capacity installations of one or two boilers, this can be accomplished with a minimum of trouble. For a large capacity steam pressurized system this can be accomplished by providing an individual drum connection for each boiler.

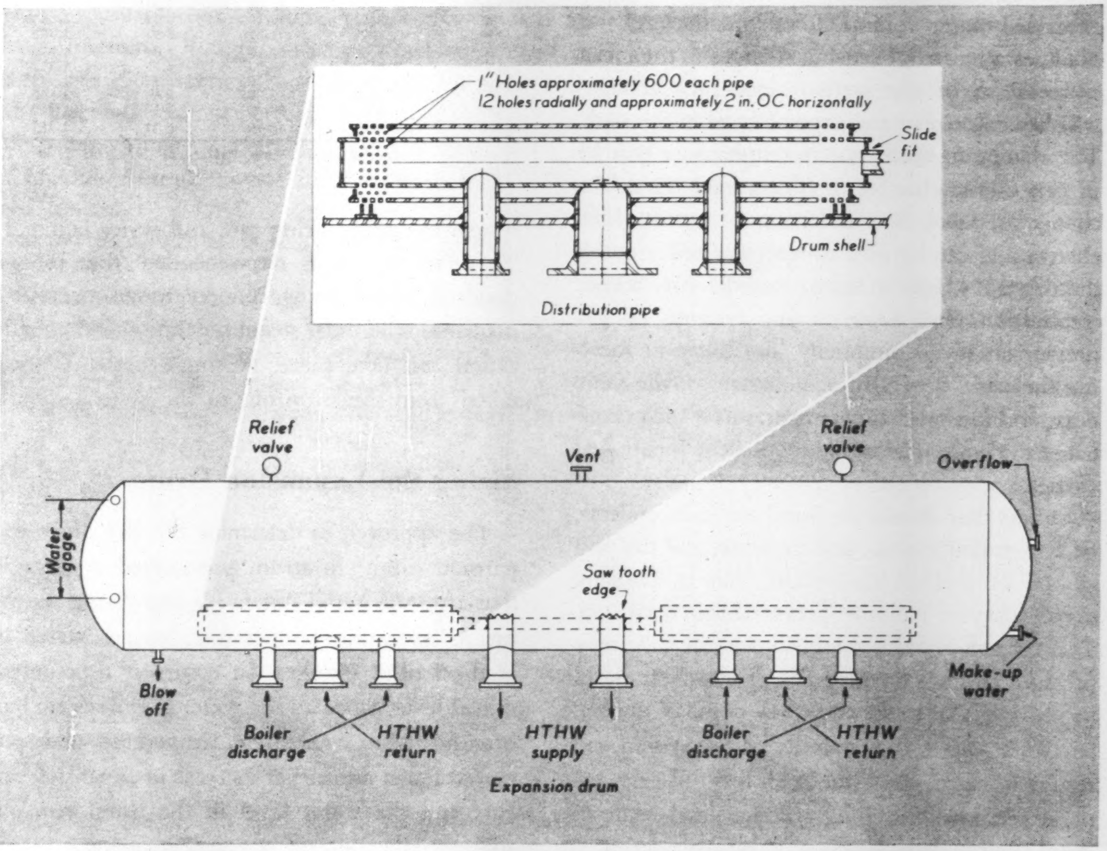
Several methods have been used to achieve uniform temperatures in the expansion drums of large steam pressurized systems. One such design is shown in Fig. 7 and described below.

In this design, the boiler connection is welded[4] to an internal perforated distribution pipe, as shown in Fig. 7. The distribution pipe is common to all boilers so that regardless of the number operating, boiler discharge water is distributed fairly evenly throughout the entire length of the drum. Surrounding this internal pipe is another perforated concentric pipe. System return water over and above that quantity required by the boiler circulating pumps is returned to the drum through this pipe and evenly distributed.

The mixing of the return water and the boiler discharge water inside the concentric pipes prevents any cold or lower temperature water from entering the drum proper and causing any temperature variation or resultant stress. Makeup water is also fed through this internal pipe.

Separate connections are recommended for each boiler. Since it is difficult to fire all of the boilers in a system at exactly the same rate, the percentage of steam in the steam-water mixtures from the boilers will differ. If the mixtures from the boilers are joined at a header, a portion of the steam from the boiler of higher firing rate will be condensed by the water from the boiler of lower firing rate. The collapse of the steam bubbles causes a low order water hammer and results in a vibration in the piping. Therefore, boiler outlet headers are not recommended for steam pressurized systems.

The use of individual boiler connections to the


1" Holes approximately 600 each pipe
12 holes radially and approximately 2 in. OC horizontally
Slide fit
Drum shell
Distribution pipe
Relief valve
Vent
Relief valve
Overflow
Water gage
Saw tooth edge
Blow off
Make-up water
Boiler discharge
HTHW return
HTHW supply
Boiler discharge
HTHW return
Expansion drum

7 EXPANSION DRUM DESIGN shown here provides good mixing of boiler discharge and return waters through use of distribution pipes. The drum serves as a suction reservoir for the system and as a manifold to integrate the operation of all of the boilers and pumps. Saw tooth edge on HTHW supply intake suppresses vortex at pipe entrance expansion drum can also reduce[3] the valving required and the number of vents, fittings, etc. in the boiler piping system.

The system pump suction should be taken from the bottom of the drum and preferably at the center of the vessel. The intake vortex should be suppressed by either a bellmouth or sawtooth suction pipe. The intake should be elevated adequately off the bottom to be above the sludge.

Inert Gas Pressurized Systems

In the gas pressurized systems, the expansion tank serves some of the same functions as the drum in a steam pressurized system. It absorbs fluctuations in system water volume and provides a means of maintaining a pressure on the system in excess of the saturation pressure. When designed[5] in its simplest and most common form —floating on the return main so that only the expanded water volume flows into the tank—it becomes a means of sensing changes in the mean temperature of the system since such changes will be reflected in a change of level in the tank. The change in mean system temperature will be in part due to changes in system load. Thus, the change in level is a reflection of system load change and can be used to reset the boiler outlet thermostat which in turn controls the burner combustion rate. Some of the features of gas pressurization — simplicity, flexibility in locating the tank, generally smaller size for the same duty, and low operating temperature which eliminates the need for insulation—were mentioned earlier.

Others that should be noted are independence of system temperature and pressure, and the possibility of sealing the system, thus minimizing makeup water and the potential for corrosion. The former permits establishment of a reserve pressure cushion to minimize or eliminate flashing of HTHW to steam at any point in the system.This adds to the stability of the system and results in easier operation with less difficulty experienced while bringing a boiler on the line or during other sharp changes of system operation.

TABLE 1 — PROPERTIES OF WATER at various temperatures and corresponding saturation pressures*

Temperature, F	Pressure, psig	Weight		Relative volume
		lb/cu ft	ib/gal	
50	—	62.42	8.34	1.00027
60	—	62.37	8.34	1.00096
70	—	62.30	8.33	1.00201
80	—	62.22	8.32	1.00338
90	—	62.11	8.30	1.00504
100	—	62.00	8.29	1.00698
110	—	61.86	8.27	1.0092
120	—	61.71	8.25	1.0116
130	—	61.55	8.23	1.0142
140	—	61.38	8.21	1.0171
150	—	61.20	8.18	1.020
160	—	61.00	8.15	1.023
170	—	60.80	8.13	1.027
180	—	60.58	8.10	1.030
190	—	60.36	8.07	1.034
200	—	60.12	8.04	1.038
210	—	59.88	8.00	1.043
212	0	59.83	8.00	1.044
220	2.5	59.63	7.97	1.047
230	6	59.37	7.94	1.052
240	10	59.11	7.90	1.056
250	15	58.83	7.86	1.061
260	21	58.55	7.83	1.066
270	27	58.26	7.79	1.072
280	35	57.96	7.75	1.077
290	43	57.65	7.71	1.083
300	52	57.00	7.76	1.089
310	63	57.00	7.62	1.095
320	75	56.66	7.57	1.102
330	88	56.30	7.53	1.109
340	104	55.94	7.48	1.116
350	120	55.57	7.43	1.124
360	138	55.18	7.38	1.131
370	160	54.78	7.32	1.140
380	182	54.36	7.27	1.148
390	206	53.94	7.21	1.157
400	232	53.50	7.15	1.167
410	263	53.00	7.09	1.177
420	295	52.60	7.03	1.187
430	329	52.20	6.98	1.197
440	367	51.70	6.91	1.208
450	408	51.20	6.84	1.220
460	455	50.70	6.78	1.232
470	500	50.20	6.71	1.244
480	551	49.70	6.64	1.256
490	607	49.20	6.58	1.269
500	666	48.70	6.51	1.283

**Based on Marks and Davis Steam Tables and prepared[4] by W. T. O'Reilly*

In large multiple boiler installations, a similar condition exists as in the steam pressurized system regarding firing rate and water hammer. To offset this, it is recommended[4] that the individual boiler leads connect to an oversized manifold where the steam separation and equalization can take place. A single outlet is then taken from the manifold to the system.

Sizing the Expansion Drum

The approach to determine the size of an expansion drum[3] in steam pressurized systems is that after the initial system fill and during warm-up to operating temperature, excess water is bled off until stabilization occurs at a predetermined level. Since all the water in the system has been heated to a maximum temperature and specific volume, no further increase in expansion occurs and the water level in the drum remains substantially constant at constant operating temperature. This is theoretically correct. However, in practice, there is considerable variation in line temperature. The magnitude of change in the flow line is relatively small but the change in the return line is larger. In most instances during light loads, the return line temperature can approach the flow line temperature. This is caused by the bypass valves, hunting of control valves, and higher leaving water temperature from heat exchangers at low loads.

The size of the drum is based on the expanded volume caused by the temperature changes indicated above. The system volume is estimated by a physical take-off of pipe, fitting and vessel volume. Having arrived at a system volume, it is fair to assume that half the volume is at flow temperature and half at return temperature. Using relative volumes corresponding to the operating temperatures, the expanded volume is readily determined. Relative volumes and other properties at various water temperature are given in Table 1. The expansion drum is then sized to provide for (1) expanded volume, (2) steam space and (3) submergence for the drum internals. Roughly, the proportions are as follows: 50 percent expanded volume, 30 percent internals and 20 percent steam space. The following sample calculation shows the method of obtaining the drum size for a steam pressurized system.

Example: Expansion drum sizing for steam pressurized system

Assume system volume of 9911 cu ft and for sizing add 25 percent for safety factor. The resulting volume for design is 12,400 cu ft of which one-half (6200 cu ft) is considered to be at flow line temperature and one-half at return line temperature. Flow line temperatures are 400 F maximum and 380 F minimum, and return line temperatures are 350 F maximum and 200 F minimum.

Flow line:

Relative volume at 400 F = 1.167
Relative volume at 380 F = 1.148
Difference = 0.019
Expanded volume = 0.019 x 6200 = 117.8 cu ft

Return line:

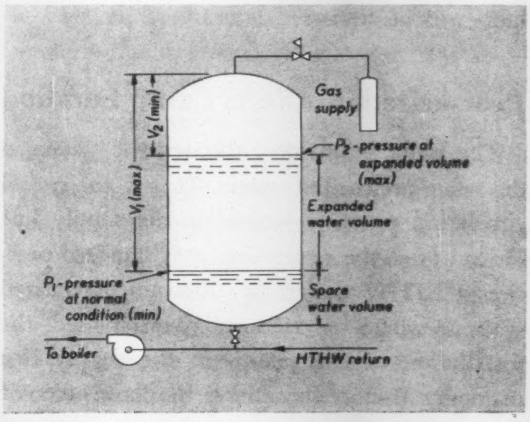
Relative volume at 350 F = 1.124
Relative volume at 200 F = 1.038
Difference = 0.086
Expanded volume = 0.086 x 6200 = 533.2 cu ft
Total expanded volume = 651.0 cu ft

For drum sizing:

Expanded volume (45 percent) = 651 cu ft
Steam space (20 percent) = 290 cu ft
Internals (35 percent) = 506 cu ft
Total = 1447 cu ft

Sizing of the inert gas pressurized drum is similar up to the point of determining the expanded volume. Numerous methods of pressurizing affect the size of the vessel and the necessary calculations. To be brief, the calculation for the simplest method is given. This provides for a constant temperature, variable pressure arrangement and uses the minimum of the inert gas. A fixed weight of gas is charged to the system initially, and only enough gas is added during operation to compensate for any leakage that may occur.

Assume a vertical tank floating on the suction of the pump as indicated in Fig. 8. Establish the maximum and minimum pressure under which it is desired to operate the plant. Establish the expanded volume and solve for V_2 in the



8 SIZING EXPANSION TANK for gas pressurized systems using fixed weight of gas requires calculation of minimum volume of gas space (V_2) by means of gas law relationships following formula relating pressure and volume:

$$P_2/P_1 = V_1/V_2$$
$$= (V_2 + \text{Expanded volume})/V_2$$

Add V_2 to expanded volume and spare volume to obtain volume of the drum. The following example will illustrate the sizing procedure.

Example: Expansion tank sizing for gas pressurized systems.

Assume the same system volume as in the previous example—12,400 cu ft—and the same operating temperatures. The expanded volume will then be the same or 651 cu ft. The maximum and minimum tank pressures are a function of system design. Assume for this calculation that the minimum pressure is 80 psia and the maximum 250 psia.

Minimum gas volume:

$$V_2 = P_1/P_2\ (V_2 + 651)$$
$$V_2 = 80/250\ (V_2 + 651)$$
$$V_2 = 306 \text{ cu ft}$$

For tank sizing:

Expanded volume = 651 cu ft
Minimum gas volume = 306 cu ft
Spare volume (10 percent) = 96 cu ft
Total = 1053 cu ft

The above method of sizing for both systems applies with the system constantly hot as indicated. In systems operated intermittently, and where automatic and unattended plant operation is desired, the expansion tank can be sized to contain the expanded volume associated with the full range of operating temperatures. This, of course, results in much larger tanks. For the system of the above example, the tank sizes would be 4578 and 3333 cu ft for steam pressurization and inert gas pressurization, respectively. This method of sizing[6] has been applied in small gas pressurized systems. The volume changes of intermittently operated systems[4] can also be taken care of by alternately discharging excess water and supplying makeup water as needed to maintain the desired level. This latter method increases the need for water treatment.

Circulating Pumps for HTHW

The hot water boiler is the source of heat but the system circulating pump (or pumps) forces the hot water from the expansion drum through the piping system to the points of use such as space heating, domestic water heating, and heat exchangers for the production of process steam. The return water, now at a reduced temperature, may be piped back to the generators and then to the expansion drum to complete the circuit or it may be returned directly to the expansion drum with a separate pump circulating water from the expansion drum through the boiler and back to the expansion drum. This second loop will be discussed later.

Pressurization Affects Pump Location

The water is pumped[1] through the system in the steam pressurized system. That is, the system circulating pump is located in the supply line instead of in the return line as is standard practice in LTHW design. In all steam pressurized systems, where an overhead drum is used, the installation of the pumps in the supply line maintains the pressure above the flash point of the hottest water and prevents steam from forming in the system. However, some line flashing may occur at the system extremities at points of increased elevation.

The net positive suction head — the difference between the total head at the pump suction and the vapor pressure of the HTHW — must be considered[3] in pump selection to prevent flashing and cavitation. Design of the suction conditions should take this into account and a pump selected to meet the design conditions.

Another safeguard against flashing or cavitation at the pump[1] is the use of a mixing connection which bypasses some of the cooler return water into the supply water line at the pump suction. This reduces the supply water temperature 5 to 10 F, which is enough to prevent flashing without decreasing system pressure. For example, if the temperature of the water leaving the expansion tank is 350 F at 120 psig or nearly saturation temperature and pressure, an unstable condition exists because a slight drop in pressure will cause flashing. But a reduction of 5 F by admixture of cooler return water will result in 345 F, 120 psig water which will not flash.

Careful attention must be given to the selection of controls to accomplish the desired mixture temperature.

In the inert gas pressurized system, the pumps may be located either in the supply or return line. They are commonly located in the return line and discharge into the boiler to take advantage of the additional head to maintain the pressure in the boiler above the saturation pressure. During periods of light loads, a portion of the HTHW supply is bypassed to maintain a boiler circulation in the single pump type installation. A separate boiler pump may also be used and this is discussed later.

Don't Overlook Density Changes

In selecting[1] the required pump capacity, care must be taken when converting pounds of water per hour into gallons per minute. All boiler capacities are expressed in lb per hr, whereas centrifugal pumps are rated in gpm. When making the conversion, it must be remembered that the pump is handling water at high temperatures and that the density of water decreases with increasing temperatures.

By way of illustration, let us say that the total load for a project is 30,000,000 Btu per hr and that the hot water supply is at a pumping temperature of 350 F, returning at 230 F. The weight of water to be pumped is 30,000,000/[(350-230) × (60)] or 4167 lb per minute. At 350 F, the specific volume of water (from steam tables) is 0.01799 cu ft per lb. So the quantity to be pumped is (4167 lb per min) × (0.01799 cu ft per lb) × (7.48 gal per cu ft) or 561 gpm. If the same weight of water was at ambient temperature the quantity would be (4167 lb per min)/(8.33 lb per gal) or 500 gpm. Failure to correct for temperature will reduce the available capacity in this case by 12 percent.

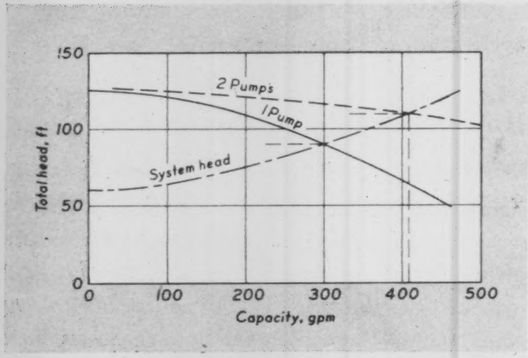
Since the pump is essentially a constant volume apparatus, it must also be remembered that on startup the pump handles cold water at increased density. This must be taken into account in the pump specifications[3] to avoid undersizing the pump motor for the startup condition. Thus, variations in density of the water over the whole operating range must be taken into account to assure proper pump operation.

How Many System Pumps?

The choice[1] between the use of a single system circulating pump and the installation of two or more pumps in parallel depends upon the nature of the load, its magnitude, and the physical location of the high temperature hot water equipment. Where the total load is small, first cost rather than the efficiency of operation will decide in favor of a single pump. For larger systems, especially where the type of load varies, two or more pumps will provide greater flexibility of operation. Variable speed drives may also be used to achieve flexibility in pump operation. Where the requirement for process steam makes up a fairly large part of the total load, a pump for this portion of the load and another for the space heating requirements will permit economical operation by not operating the space heating pump during the summer. In larger installations, the location of buildings frequently indicate several loops or circuits each with its own pump. In any case, a spare pump is essential since distribution of HTHW must not be interrupted. Provision must be made so the spare pump can be put on the line immediately.

Capacity in Parallel Not Doubled

Two pumps operating in parallel should have similar head capacity curves and equal head at shutoff. However, two identical pumps, each having a capacity of 300 gpm against a total head of 90 ft, will not deliver 600 gpm when in parallel on the same piping system. To determine the operation of the two pumps in parallel, it is recommended that a combined head-capacity curve be drawn similar to that show in Fig. 9. A system-head curve is then imposed on it in order to determine the final operating point of the two pumps in parallel. The head-capacity curve for each pump is shown in Fig. 9 as the lower pump curve. The combined output when operating in parallel is shown as the upper pump curve. The points on this curve can be found by doubling the capacity on the



9 PUMPS OPERATING IN PARALLEL should have similar head capacity characteristics and equal head at shutoff. Two identical pumps operating in parallel, however, will not deliver twice as much flow as one pump. Operating point of parallel pumps can be determined by constructing head-capacity curves and system head curve as shown above. Curves shown are for general case in which a static head exists in the system. In a closed heating system, the static head is zero and the system head curve passes through the origin

one pump curve at the same head, since the two pumps have the same characteristics.

Next, the system head curve, comprising friction head plus static head, is drawn. The static head is a function of the difference in elevation of the points of suction and discharge in open systems, and remains constant for any given system. In a closed system the static head on the pump is zero and the system curve passes through the origin. The friction head loss in a system of pipes, valves, and fittings varies as a function (roughly as the square) of the water flow through the system. The system head curve is shown in Fig. 9 for the general case in which a static head exists. With a pump operating at constant speed and no external regulation to control the pump capacity, the pump will operate at the intersection of the pump head-capacity curve and the system head curve. For the example of Fig. 9, the intersection point for one pump operating is at 300 gpm against a head of 90 ft, and for two pumps operating in parallel, the intersection is at 410 gpm and 110 ft head.

Boiler Circulating Pumps

Where the friction head in the circulating system varies, as with two or more pumps which are not all operated continuously, the use of a boiler recirculating pump is advisable. In fact, some boiler manufacturers insist on the use of boiler recirculating pumps to meet light load conditions and insure adequate circulation through the boiler under any load conditions.

To maintain two independent pump circuits instead of one, with the system circulating pump performing the entire duty, water is circulated through the boiler or boilers by means of a constant speed pump. At the same time, a distribution circulating pump circulates water through the system. The recirculating pump insures a constant flow through the boiler regardless of the system load in the steam pressurized system. In the inert gas pressurized system, the boiler recirculating pump (in a dual pump cycle) is used to maintain an adequate boiler temperature for domestic hot water heating, if desired, and to prevent internal condensation in the boiler. In both cases, a mixing connection at the inlet of the system circulating pump allows the flow temperature in mild weather to be lowered to any desired temperature.

Select HTHW Pumps Carefully

The HTHW pumps should be designed[6] for continuous duty at the temperatures experienced in the system. The stuffing box and bearings should preferably be water cooled. To minimize leakage and, thus, the need for makeup water and to prevent loss of pressure in gas pressurized systems, balanced mechanical seals are often used. Fluorocarbon plastic packings are also used. Provision should be made to prevent foreign material from entering the seal face. The pump casings are usually of cast steel and the trim is chrome and cast iron.

A type of pump available that eliminates the shaft seal problem is the "canned-motor" pump. The impeller in this type pump is mounted on the rotor shaft. Both the rotor and stator are sealed from the circulating medium by means of corrosion resistant cans or shields. The motor is then submerged in the circulating medium under line pressure. An external heat exchanger is provided to prevent overheating. These pumps have been designed and used for other purposes at temperatures well above those experienced in high temperature hot water heating systems.

Boiler Feed Water Pumps

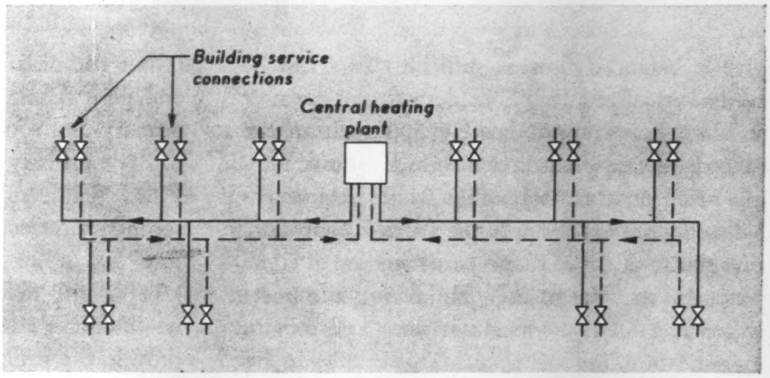
Feed water pumps are necessary to supply makeup water to replace that lost through leakage. Both positive displacement and centrifugal pumps are used for this purpose. They must be suitable for operation at the pressures and temperatures involved. Since makeup water requirements are a minimum, relatively small capacity pumps are required to meet usual makeup water needs. A standby pump should be provided. Operation is sometimes sequenced by means of an alternator. In many systems, relatively large capacity makeup pumps are included for use in the event a situation arises in which a sudden loss of water occurs.

HTHW Distribution System Design

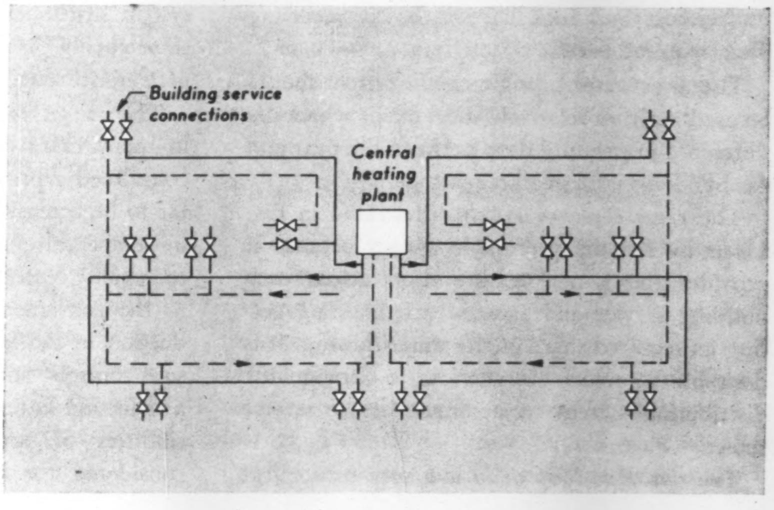
The distribution system can take a number of conformations[4] as follows:

1) Direct return, single circuit
2) Reverse return
3) One pipe loop main
4) Primary and secondary systems

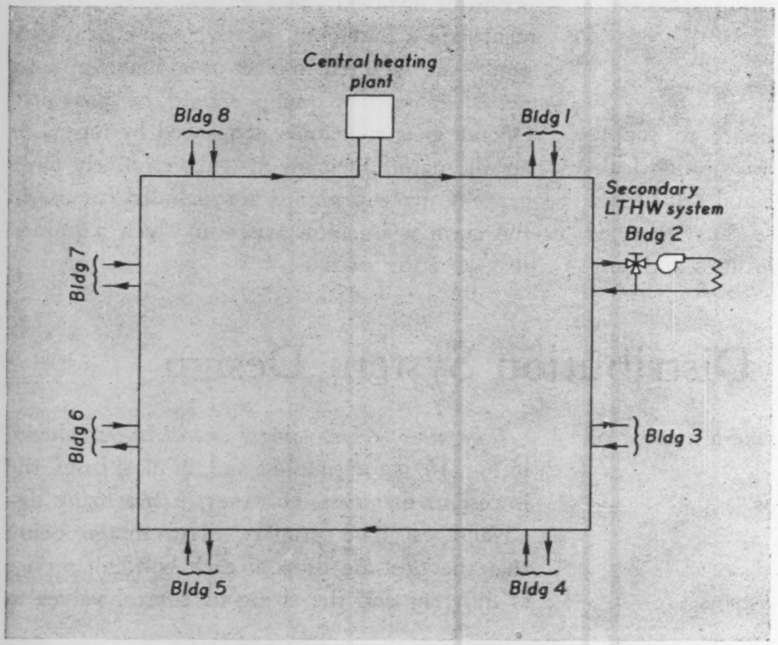
The direct return, single circuit layout, shown in Fig. 10, is the simplest and, in most cases, the lowest in first cost. However, it has many disadvantages. The primary disadvantage being that the pressure drop at each building service is different and the sizing of control valves to



10 DIRECT RETURN, single circuit piping layout is simplest and, in most cases, lowest in first cost of systems used to distribute HTHW. Control valve sizing is difficult when mains are long due to large differences in pressure drop at building services



11 REVERSE RETURN piping layout provides same pressure drop across each building service and simplifies control valve sizing. It is often difficult to arrange the distribution system to accommodate a reverse return



12 ONE PIPE LOOP MAIN system is an economical distribution system. HTHW is supplied to secondary LTHW systems for individual buildings. This system is particularly applicable to small plants employing one pump for both boiler circulation and system distribution since the water flow in system is constant

give a balanced flow is difficult. This can be easily visualized by considering the nearest building being approximately 200 ft from the central heating plant and the furthermost building being 6000 ft away. This would require the balancing valve to supply the friction equivalent of 5800 ft of pipe. If the balancing valve is not properly set, the nearer buildings take more water at a lower temperature drop and rob the extreme building of water. This condition becomes exaggerated at light load when the head on the distribution pump is reduced and the furthermost buildings have difficulty receiving their required water.

The direct return, single circuit system should be used[4] only on relatively short mains where the difference in pressure drop between the near and far buildings is of small magnitude.

The *reverse return system,* illustrated in Fig. 11, is by far the preferable system because it provides the same pressure drop across each building service and assures each building getting its required share of the water flowing. It is desirable to make every effort to arrange the distribution system to accommodate a reverse return.

The *one pipe loop main* is a very economical layout for distributing the heat energy as only one pipe is required. The system is actually a primary and secondary system as shown in Fig. 12. The primary loop might be designed for 300 F flow temperature and an 80 F drop, while the secondary is designed for a 220 F flow temperature and a 20 F drop. This system provides LTHW for the building heat release surfaces while taking advantage of the high temperature drop in the primary mains. This system has particular application to a small central plant using a common pump both for boiler circulation and system distribution. The advantage in this instance being that there is always a constant flow of water through the boiler irrespective of load.

The use of *primary and secondary systems* is in many cases desirable. The HTHW can be considered a primary distribution medium, similar to high tension electricity. It can be reduced in temperature by means of a converter at a reduction center and distributed as LTHW to the consumers. The advantages being a reduction in the high pressure piping, high pressure controls, and underground heat loss due to a reduction in temperature differential. The possibilities of secondary reduction should be considered for all types of installations. The system is especially applicable to multiple consumers of very small loads such as a housing project with single family dwellings, etc.

The distribution of the secondary system can be any of the three previous systems — direct return, one pipe loop (Fig. 13) or reverse return.

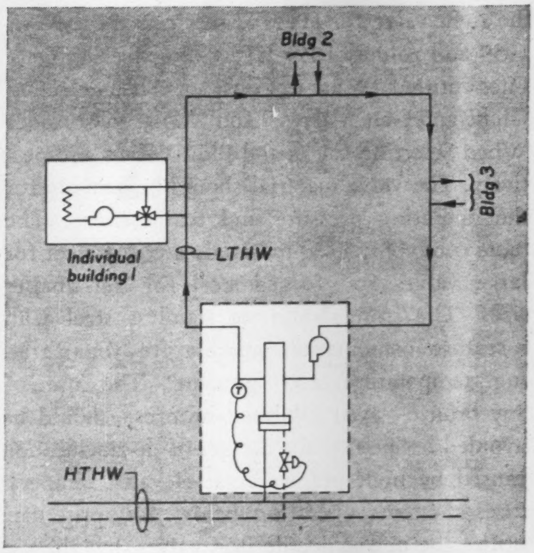
What to Consider in Piping Design

The considerations in designing the HTHW lines are similar to those of any high temperature system. The design and installation should be made to conform with the limits of the American Standard Code for Pressure Piping ASA B31.1.

Line sizing depends first upon the selection[7] of an economical temperature drop taking into consideration the cost of materials and installation as affected by pressure, minimum permissible water temperature entering the boiler, and the characteristics of the heat exchange equipment to be employed. Other factors in sizing are the same as for the LTHW piping except that the effect of elevated water temperature on the pipe head loss must be taken into account. Curves to accomplish this can be found in References 7 and 8.

In the interest of tightness[6], either welded or flanged joints are used. Flanged joints are kept at a practical minimum. When screwed joints are used, a seal weld is applied. Flanges can be either the 1/16 raised face type or the ring joint type. Flexible metallic gaskets are recommended for use with the raised face flanges to maintain tightness while counteracting the effects of piping expansion and contraction. For flange, bolting and gasket details see the "HPAC Engineering Data File", January 1959 entitled, "What to Consider When Selecting Valves."

Air vents are provided at all high points in the system and sludge separators at the low points. Allowance must be made for piping flexibility, expansion, and the freedom to expand without warping and excessive strains. Bellows type expansion joints with stainless steel bellows are used to take up expansion as are expansion bends.



13 PRIMARY AND SECONDARY systems employ HTHW as the primary heat distribution medium. The HTHW is reduced in temperature by means of a converter in a reduction center and distributed to consumers as LTHW through one pipe loop mains as shown here, or through a direct return or reverse return secondary system

Insulation of the HTHW lines is essential for economical operation. Insulating materials used for other high temperature services are used on HTHW. A properly insulated HTHW main will lose heat[7] equal to about 6 or 7 percent of the design load. Installation of HTHW lines underground also follows good practice for other pipe lines similarly located. The possibility of external corrosion of underground lines suggests the use of moisture resistant insulations, and the use of coatings that will resist any deterioration caused by the properties of the soil in which the piping is embedded. Various methods of insulating and types of insulation are available for this service.

Valve Selection Affects Maintenance

The valves used in a high temperature hot water system are very important[4] and improper use and selection can lead to considerable maintenance. In general, the globe pattern is preferred for all valves in order to assure tight shutoff for maintenance. Where the higher head loss of globe valves is undesirable, gate valves or plug valves are used. For details on selecting the right valve for HTHW service see the April 1959 and August 1959 HPAC Engineering Data Files entitled "What to Consider When Selecting Globe and Gate Valves," and "What to Consider When Selecting Cocks and Plug Valves," respectively. The valve material should be suitable for the operating pressure and temperatures. The most commonly used materials are cast steel for large valves and forged steel for the smaller sizes. The trim should be stainless steel with a seating combination suitable for the operating temperature and pressure. The use of any bronze—even inhibited bronzes—should be avoided because of the danger of de-zincification caused by high pH water at elevated temperatures. Systems operating below 100 psig may utilize the newer ductile iron valves, but the use of standard cast iron is discouraged because of the danger of water hammer shock. On systems operating at the higher temperatures and pressures, welded ends are recommended. The smaller valves can have socket weld ends, or screwed ends with a seal weld.

All other piping accessories, check valves, strainers, etc. should be made of the same material as the valves.

Instruments in the Piping System

The application of gauge to a high pressure system should be exercised with discretion and only such gages as are absolutely necessary should be provided. Gauges of the bourdon type with forged steel or barstock gauge cocks are used.

Thermometers where used should be provided with separable wells. Level gages for expansion drum etc., should be of the packless type and should require the least possible number of connections to the drum. On large installations where a number of level points are required for functional operation, a differential pressure level controller can be used with a switch for each function but only two connections to the drum.

[The editors wish to acknowledge the assistance of the consulting engineers who cooperated in the preparation of this report by providing the information included herein. Figures 3 *through* 8 *and* 10 *through* 13 *were provided by William T. O'Reilly. Figure* 9 *was provided by Donald T. Robbins. This discussion of HTHW will be continued in a future issue, at which time end use heat exchange equipment, controls, and other topics will be discussed.]*

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CAPACITIES: GALLONS PER HOUR

Pipe Size and Fig. No.	Orifice	Lead	OPERATING PRESSURE: LBS. PER SQUARE INCH							
			5	10	20	30	40	60	80	100
1/8" Fig. 629	69	69			2.7	3.3	3.8	4.7	5.4	6.0
	61	61			4.2	5.1	5.9	7.2	8.3	9.2
	61	53	2.7	3.7	5.3	6.5	7.5	9.2	10.5	11.8
	53	53	4.0	5.7	8.2	10.0	11.5	14.1	16.3	18.2
	49	49	5.6	7.9	11.1	13.6	15.7	19.3	22.2	24.8
1/4" Fig. 629 or Fig. 631	3/32	3/32	9.6	13.5	19.2	23.4	27.0	33.0	38.4	42.9
	1/8	3/32	12.2	17.3	24.4	29.9	34.6	42.4	49.0	54.9
	1/8	7/64	14.6	20.6	29.1	35.7	41.0	50.4	58.4	65.1
	1/8	1/8	15.9	22.5	31.9	39.2	45.1	55.2	63.7	71.5
	11/64	1/8	21.7	30.6	43.2	53.0	61.1	75.0	86.4	98.0
1/4" Fig. 629 or Fig. 631	3/16	5/32	30.5	43.2	61.1	74.9	86.4	107	122	136
	7/32	3/16	45.1	63.8	90.5	110	128	156	180	202
	13/64	13/64	54.7	77.8	108	134	155	191	217	246
	7/32	7/32	59.8	84.5	120	146	169	207	240	267

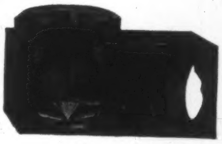
Fig. 631

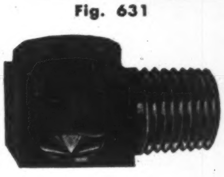
Fig. 629

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CAPACITIES: GALLONS PER HOUR

Nozzle No.	OPERATING PRESSURE: LBS. PER SQUARE INCH							
	10	25	30	35	40	60	80	100
1.35					.57	.70	.81	.90
1.65					.75	.92	1.06	1.18
2.00				.87	.94	1.14	1.32	1.49
2.50			.98	1.01	1.13	1.39	1.60	1.80
3.00		1.00	1.10	1.18	1.27	1.55	1.79	2.00
3.50		1.30	1.41	1.54	1.64	2.01	2.32	2.60
4.00		1.50	1.64	1.78	1.90	2.33	2.69	3.00
4.50		1.90	2.09	2.25	2.40	2.94	3.40	3.80
5.00		2.20	2.41	2.60	2.78	3.41	3.94	4.40
5.50		2.40	2.63	2.84	3.04	3.72	4.30	4.80
6.00		2.60	2.85	3.08	3.28	4.03	4.66	5.30
7.00		3.00	3.30	3.55	3.80	4.65	5.37	6.00
7.50	2.02	3.20	3.50	3.78	4.05	4.96	5.74	6.40
8.30	2.27	3.60	3.95	4.27	4.55	5.58	6.45	7.20

Fig. H-261

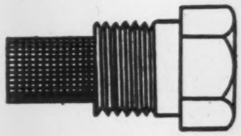
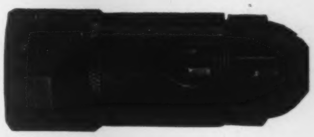


Fig. F-80 Brass



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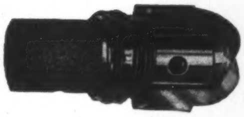
Fig. F-80
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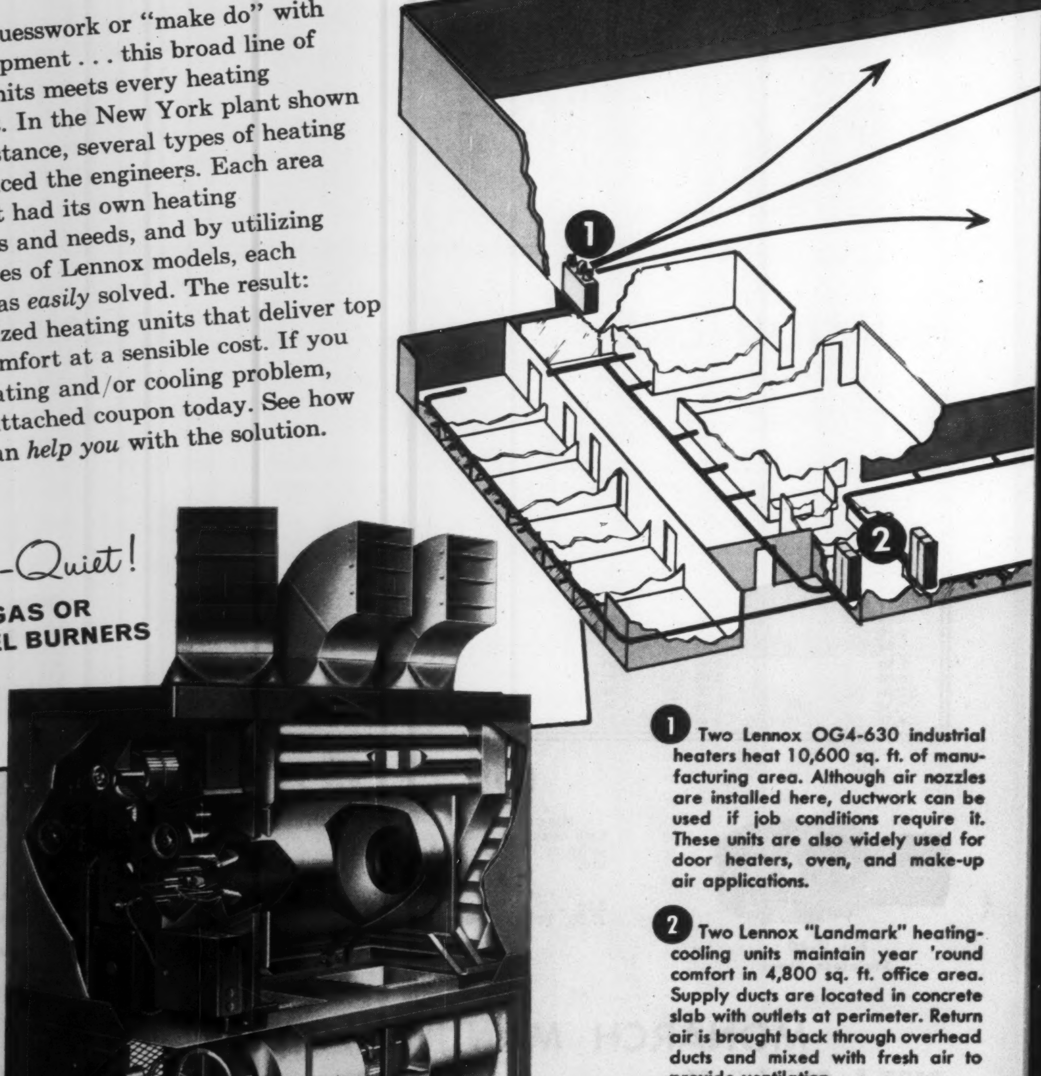

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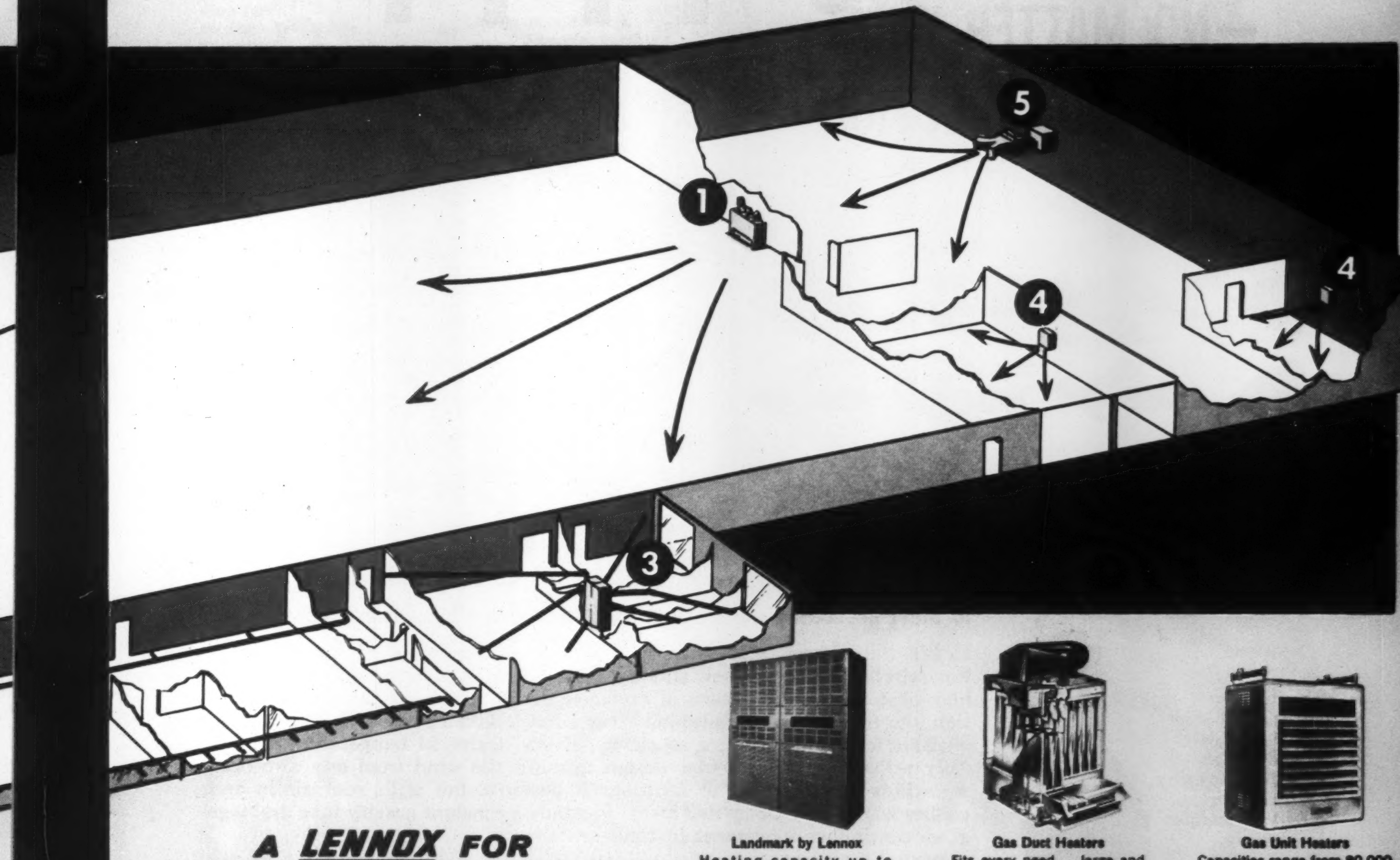

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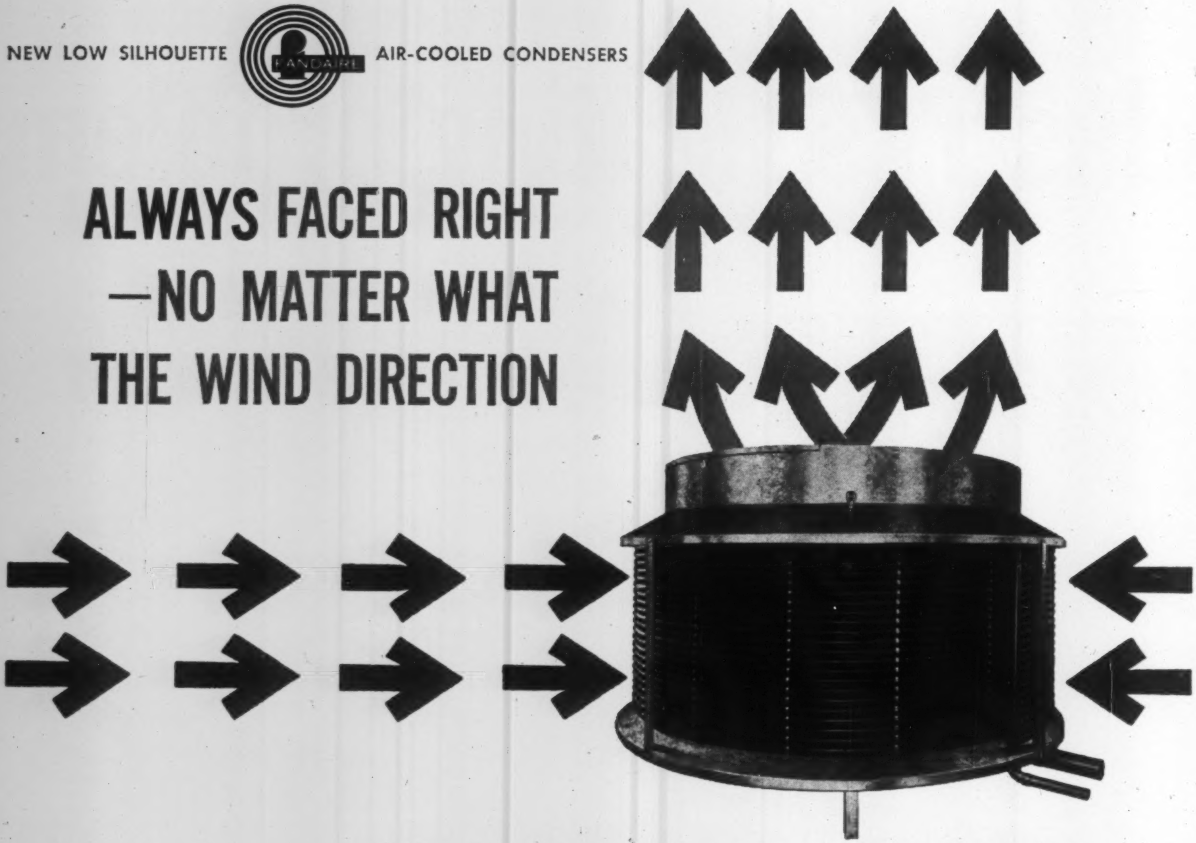

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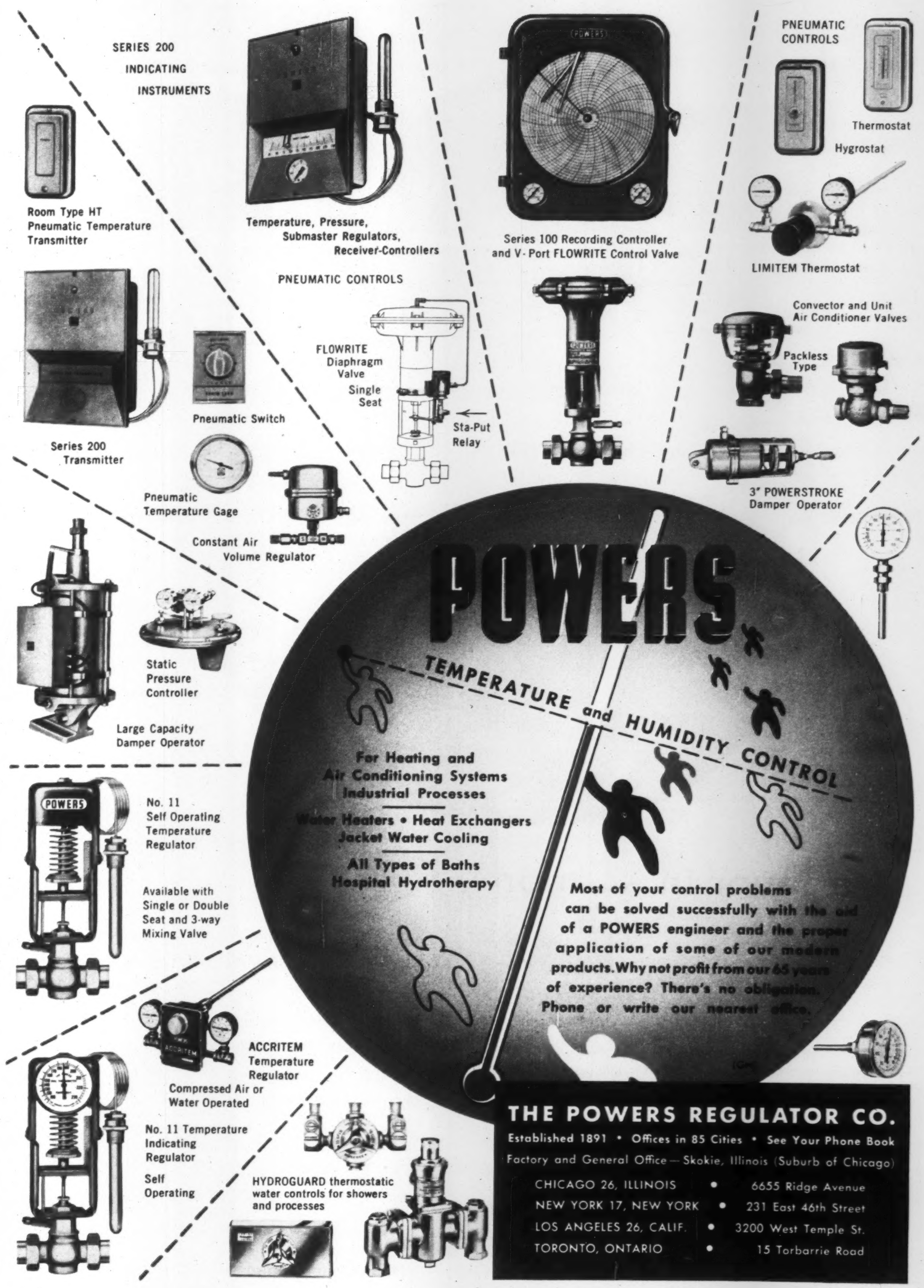
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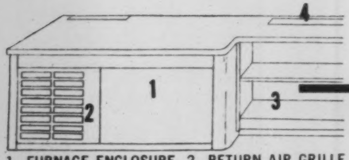

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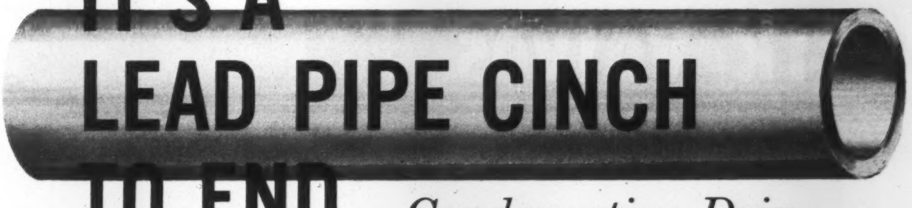
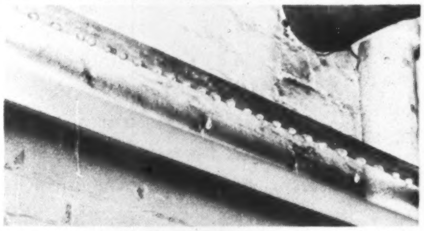


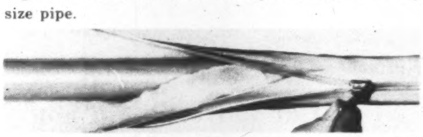
IT'S A LEAD PIPE CINCH TO END *. . . Condensation Drip, Freezing, Rust, Corrosion and Hot Spots*

with . . . Zippertubing

ZIPPERTUBING is the simplest, most inexpensive way to protect any type heating, air conditioning or water pipes from atmospheric or temperature hazards. You simply zip ZIPPERTUBING around the pipe – one man can do it – and your troubles are over!

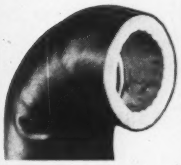


ZIPPERTUBING ANTI-DRIP COVERS end the unsightly aspect of condensation drip, stem corrosion, halt bacteria growth around moist pipes, prevent the rotting of walls and floors around the pipes. Covers are supplied to custom-fit pipes, so installation is a simple matter of placing the covers around the pipe, adjusting cover as to length and zipping close. Zippertubing is available in a wide variety of colors to fit any size pipe.



ZIPPERTUBING ANTI-FREEZE COVERS provide a cold weather overcoat for pipes . . . provide permanent protection against freezing temperatures. Outer covering is made of Vinyl; insulation is fiber glass. Cover provides two-way insulation: Heat or cold (when pipes are used for air conditioning) is held in the pipes; outside temperatures cannot affect the pipes.

ZIPPERTUBING INSULATION ENVELOPE OF COATED DACRON FOR "HOT SPOTS"
Initially developed for the missile and aircraft industry, this insulation envelope is now being widely used to cover hot spots in piping. Zippertubing insulation envelope permits pipes to be handled easily and without danger regardless of temperature in the area and protects pipes from the deterioration caused by excessive heat.



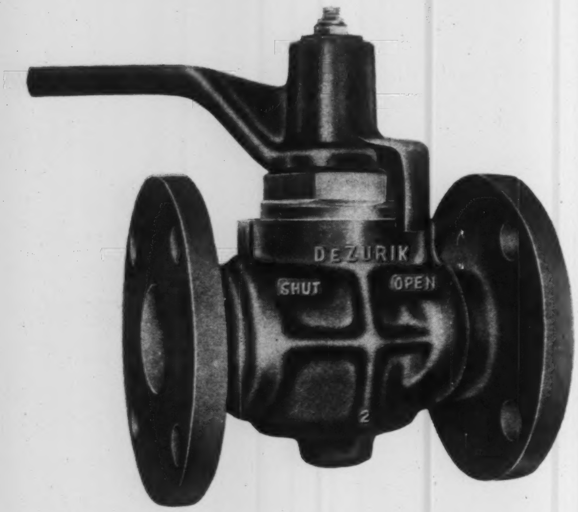
ZIPPERTUBING FITS EASILY OVER ELBOWS AND JOINTS
Zippertubing takes the curves without effort . . . zipping easily to a snug fit.

ZIPPERTUBING is available to fit any size pipe and with any thickness of insulation required. For full information on how Zippertubing can help you, write for free literature. Our technical department will be glad to answer specific questions regarding Zippertubing. There's no cost . . . no obligation.

THE Zippertubing CO.
752 S. San Pedro Street Los Angeles 14, California

DeZurik Valves . . .

. . . so obviously right for air conditioning!



DeZurik Valves, with exclusive Eccentric Action, provide advantages you find on no other valve! Dead-tight shut-off . . . easy, quarter-turn operation every time, WITHOUT LUBRICATION . . . longer life . . . no chatter or whine . . . these features make DeZurik Valves so logical . . . so obviously right for air conditioning service.

For more information, see the DeZurik representative in your area, or write to

DeZURIK CORPORATION
SARTELL, MINNESOTA

DeZurik Valves supplied for air conditioning service are made of a close-grained nickel chromium alloy iron for high strength and good corrosion resistance. Resilient plug facings guarantee tight shut-off. Throttling characteristics are uniform throughout the operating range; the same valve can be used for shut-off or throttling. Straight-thru flow provides high capacity and low pressure drop with a minimum of turbulence.

DeZurik Valves can be supplied with a pressure gauge connection on the downstream side of the valve body for use in balancing. They can also be supplied in three-way and four-way models.

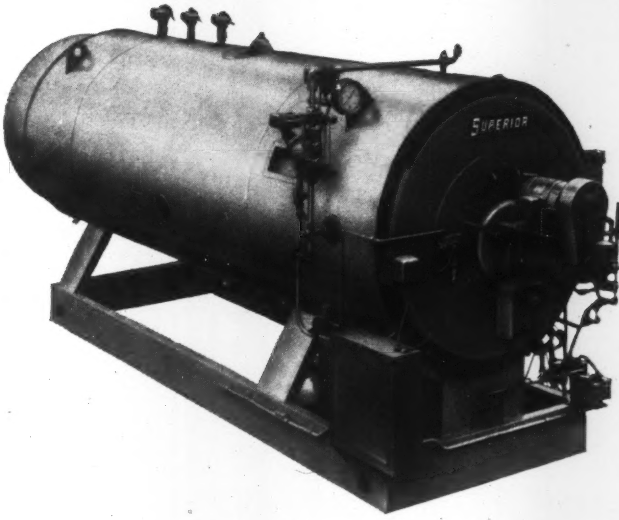
Typical applications include:

Chilled Water Balancing

Chilled Water Pump Shut-Off

Condenser Pump Shut-Off

Cooling Tower Shut-Off and others.



This is the PACKAGED BOILER

that meets ALL the "specs"

BOILER SPECIFICATIONS

- Undivided responsibility ✓
- 5 sq. ft. of heating surface per boiler horsepower ✓
- Built-in induced draft ✓
- 4-pass, down-draft design ✓
- Burn oil or gas, or both ✓
- Fully automatic operation ✓
- Dependable rotary burner ✓
- Insulated and jacketed ✓
- 80% thermal efficiency guaranteed ✓
- Factory-fire-tested ✓

Many packaged boilers will meet *some* of the specifications listed here. Superior Packaged Boilers meet them ALL. Today, more and more packaged boilers are being purchased on the specifications of architects and consulting engineers. Those consulting engineers are demanding that packaged boilers "measure up" to design and performance standards which assure buyers both operating economy and long-lived dependability.

Superior Packaged Boilers . . . built to the highest standards in the industry . . . meet the most exacting "specs", and usually exceed them. That is why Superior Packaged Boilers are so often recommended and so quickly approved by experienced consulting engineers.

In addition to the Type C, illustrated, Superior manufactures both fire-tube and water-tube boilers in a wide range of sizes which makes it the most complete line of fully packaged boilers available. If you will indicate the capacity in which you are interested, we will be happy to assist in the unbiased selection of boiler equipment suited to your specific operations.

Write today for bulletin 14C.

SUPERIOR
TYPE C

Specialists in PACKAGED BOILERS . . . exclusively

SUPERIOR PACKAGED BOILERS

SUPERIOR COMBUSTION INDUSTRIES, INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

Best for ductwork or spiral conduit

Bethcon Galvanized Sheet Steel

Here, running side by side, are ductwork and spiral pipe for the heating and air conditioning systems of a large new office building. Bethcon galvanized steel sheets were extensively used in the fabrication of both of these component parts.

Bethcon sheet steel is just right for sheet metal work such as this. First, being steel, Bethcon is strong and rigid, permitting long spans with minimum support. Second, Bethcon is neither too soft nor too hard; it's ideal for easy shopwork and a sturdy end-product. Third, Bethcon's zinc coating is second to none for its refusal to flake or peel off.

Bethlehem's continuous galvanizing process includes a special annealing cycle which gives the steel its desirable strength-with-ductility combination. Seconds later the zinc is applied, and applied so tightly that it permits forming never before considered practical for galvanized steel.

Bethcon is available in a wide variety of gages, with either plain open hearth or copper-bearing (Beth-Cu-Loy) steel for the base metal. Just get in touch with the nearest Bethlehem representative for whatever details you need. Or write direct to our home office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

HEADROOM PROBLEMS

are but one of many reasons why leading gas companies now recommend a

FIELD DRAFT CONTROL

for commercial-industrial GAS equipment

Proven in thousands of gas installations, Field does everything a draft diverter does—AND MORE—offering new simplicity, new flexibility, new precision in the control of draft.

Here's how Field helps make **GAS** an even finer fuel:

1 —COMPACT SIZE: Field is small, compact, can be placed in a variety of approved locations. Limited headroom no longer presents a draft problem.

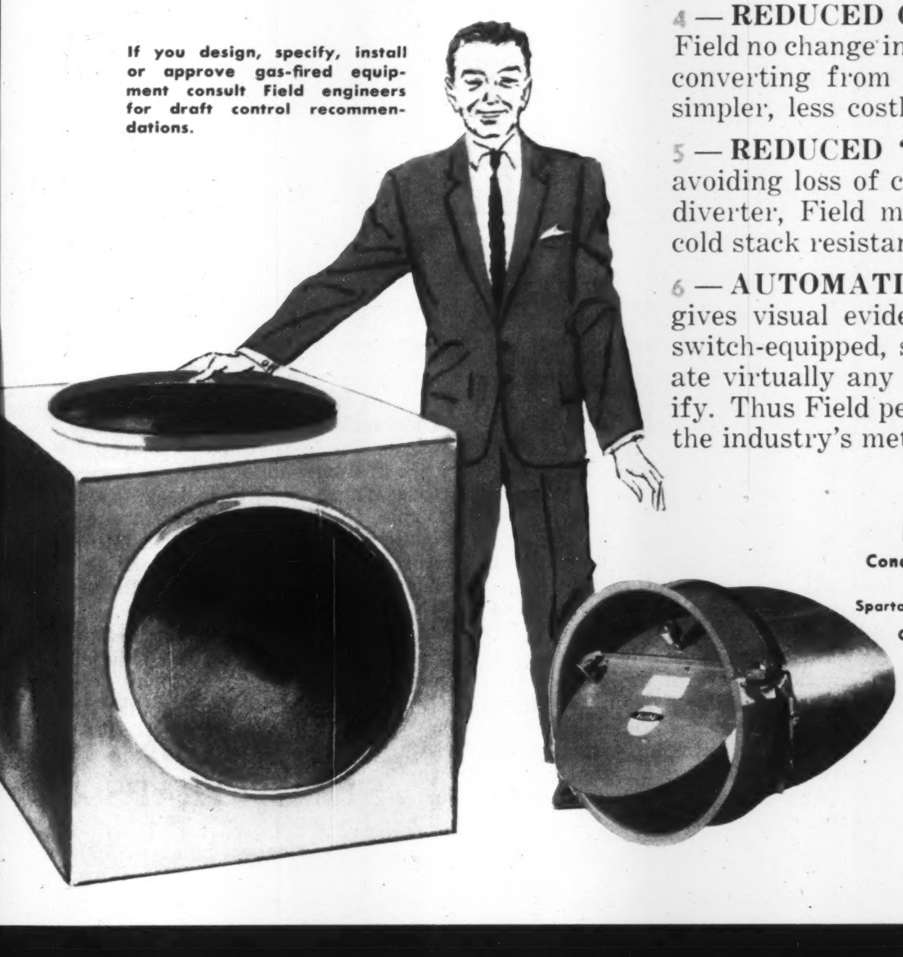
2 —DRAFT ASSISTANCE: With Field you can utilize the draft assistance of the chimney, with settings as low as .002″, as high as .35.″ Draft-short installations are avoided.

3 —LOAD FLEXIBILITY: With a Field firing rates can be varied — increased for increased loads, or decreased, and without loss of efficiency. Now gas is an even more flexible fuel.

4 —REDUCED CONVERSION COSTS: With a Field no change in breeching area is required when converting from coal or oil. Now it is quicker, simpler, less costly to convert to gas.

5 —REDUCED "START-UP" SPILLAGE: By avoiding loss of chimney prime, permitted with a diverter, Field minimizes the spillage caused by cold stack resistance.

6 —AUTOMATIC CONTROL: Field not only gives visual evidence of any spillage, but, when switch-equipped, spillage will automatically actuate virtually any response an engineer may specify. Thus Field permits still another refinement in the industry's meticulous handling of its fuel.



If you design, specify, install or approve gas-fired equipment consult Field engineers for draft control recommendations.

FIELD CONTROL DIVISION

Conco Engineering Works, Inc., Mendota, Illinois

AFFILIATES:

Spartan Tool Division — Powered Sewer Cleaning Equipment
Materials Handling Division — Cranes, Hoists
Conco Building Products, Inc. — Brick, Tile, Stone

field

Why Every Steam Heated Unit Needs its Own Steam Trap

. . . the theory, practice and proof of "unit trapping" for top temperatures

Using an individual trap for each steam heated unit, including each separate coil, chest or chamber of a machine—pays off for the user.

Here are just two examples:

1. On a creamery dryer

Drainage Method	*Air Temperature*
Restricted Blow-thru	250°
Group trapping (1 trap for 8 coils)	225°
Armstrong Unit Trapping (8 traps—1 for each coil)	**309°**

2. On a platen press

Drainage Method	*Processing Time*
Restricted Blow-thru	50 minutes
Group Trapping	35 minutes
Armstrong Unit Trapping	**25 minutes**

Why Unit Trapping Works Best

It is reasonable to assume that no two steam heated units will have *identical* condensing rates. Even the slightest difference in rate will cause a difference in steam pressure drops through the units. Here's where the trouble starts. Condensate from each unit may flow to the trap. But, what about air and other non-condensibles in the system? A difference in pressure drops too small to be indicated by an ordinary pressure gauge will permit backflow of steam from the higher pressure units to the lower pressure units. This backflow of steam may even impede flow of condensate from the lower pressure unit to the trap . . . and it will definitely impede or block off flow of air to the trap. The result is sluggish heating, reduced temperatures, reduced output, fuel waste and increased possibility of corrosion. Figures 1, 2 and 3 diagram the action.

How Different Condensing Rates Can Slow Production

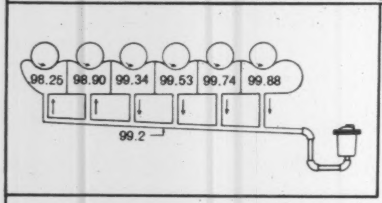


Fig. 1 This is a 6-roll ironer shortly after it has begun operating on 100 psi steam. When cold, wet material passes over chest 1, steam condensing rate is high and pressure drops accordingly. The pressure drop in chest 2 will not be as great, and so on down the machine as the material becomes progressively hotter and drier. Average pressure in the chests then is 99.27 lbs., and drain header pressure is slightly less, about 99.2 lbs. Under these conditions, steam from drain header enters chests 1 and 2 (as indicated by arrows at side of drain lines) because of pressure difference. Though condensate from chests drains by gravity, air can't leave chests countercurrent to incoming steam. Fig. 2 shows what happens next.

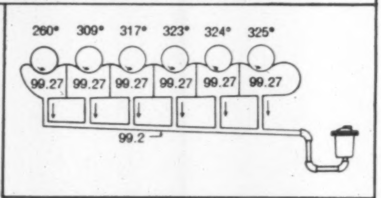


Fig. 2 This is the same 6-roll ironer after it has been operating a while. Air has accumulated in chests 1 and 2, reducing condensing rate and decreasing pressure drop. This process repeats itself down the line until pressures are as shown—that is, enough air will accumulate in each chest so that condensing rates and pressure drops of all chests will be about equal. The net result is shown in chest temperatures which are actual pyrometer readings taken on a 6-roll ironer, drained by a master trap, in a Chicago laundry. The laundry was making 337.9°F steam, but getting an average of only 309.6°F from the ironing surfaces, necessitating slow operation and frequent reruns. Then they tried Armstrong unit trapping—see Fig 3.

How Unit Trapping Prevents Trouble

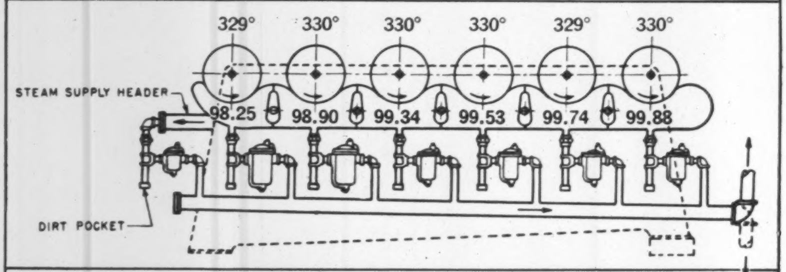


Fig. 3 This is the same 6-roll ironer, now unit trapped. Temperatures shown are also actual pyrometer readings—the average of 329.6°F is 20° higher than with group trapping. This is because air is continually removed from each chest into the drain header, and cannot get back into any chest.

Unit Trapping Not Costly

No engineer wants any more mechanical devices in his plant than are absolutely necessary. But, the moderate additional cost of using two or more small traps, instead of one big one, is saved over and over again in improved efficiency.

If the traps are Armstrong, maintenance is no problem. And users frequently tell us that Armstrong traps outlast others two and three to one.

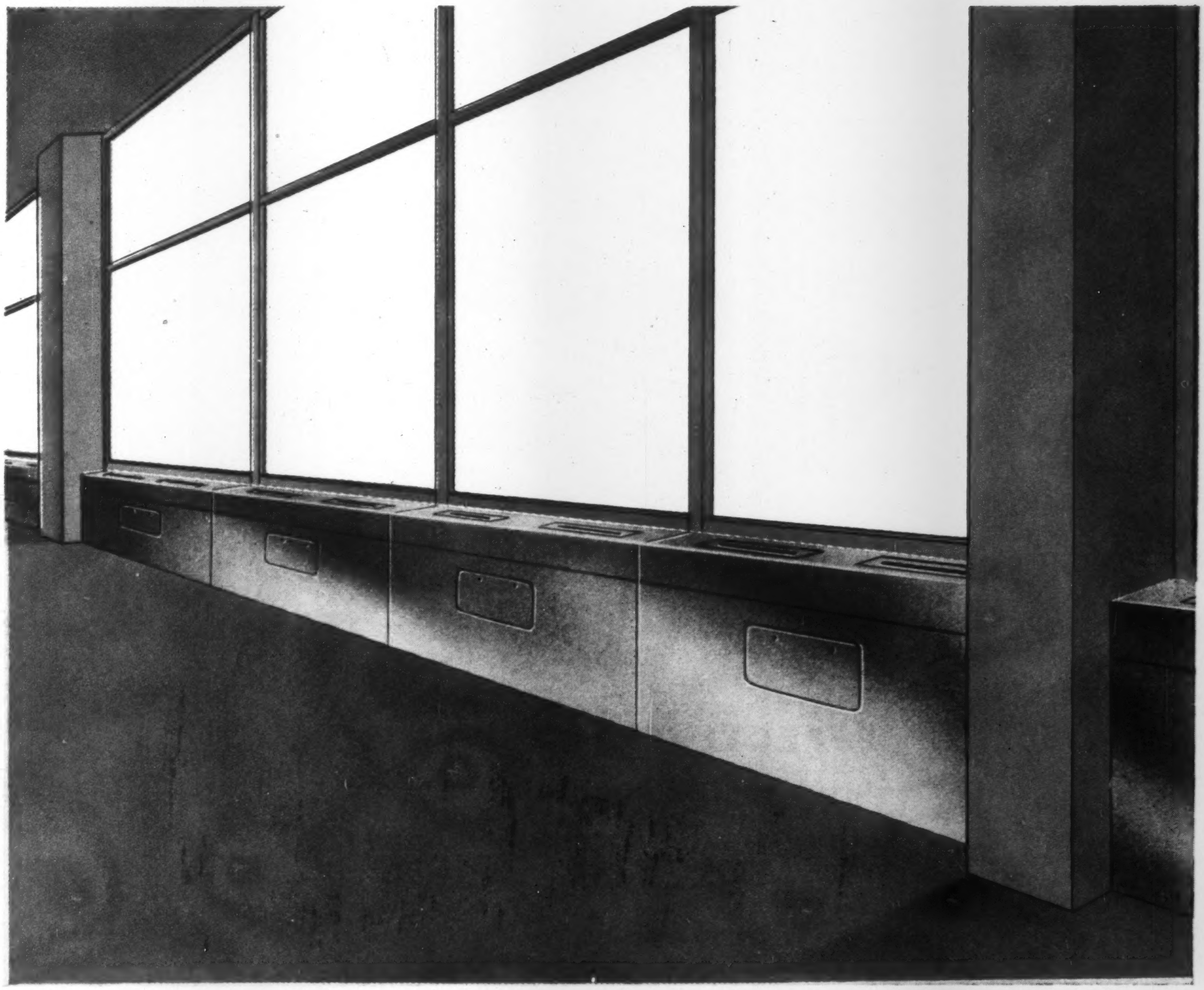
Steam traps usually represent a fraction of 1% of the cost of the equipment they drain. Does it make good sense to lose 10% or more of equipment capacity to save a few dollars on traps?

Why not test Armstrong unit trapping in your plant. If you are not completely satisfied with the results you can return the traps for a full refund of the purchase price. There is little to lose—lots to gain. Call your local Armstrong Factory Representative or Distributor, or write **Armstrong Machine Works, 8741 Maple St., Three Rivers, Mich.**

ASK FOR the 44-page Steam Trap Book and reprint of article on Unit Trapping.

801ST

ARMSTRONG STEAM TRAPS



year-'round air conditioning in one system

Buensod high velocity Dual Duct air conditioning cools, heats, humidifies and dehumidifies through every season of the year. Dual Duct is the only all-air method which does not require any seasonal change in method of operation. And simply designed enclosures — exclusive for use with Buensod units — completely conceal and finish under-window installations.

Just as the enclosure design is utter simplicity, the "workings" of the unit are the least complicated of any air mixer.

Simplicity of engineering gives Buensod mixing units extra long life. Coupled with outstanding design, they constitute the ideal choice for new and renovated multi-story office buildings, hospitals, institutions and hotels. May we send you further information? Just write:

BUENSOD-STACEY

BUENSOD dual-duct

Buensod-Stacey, Inc. • 45 West 18th Street, New York, N. Y.

. . . for Consulting Engineers • Mechanical (Heating, Piping, and Air Conditioning) Contractors • Engineers with Plants and Big Buildings
Engineering Approach Essential To Good Air Pollution Control
See this month's HPAC Engineering Data File—page 91
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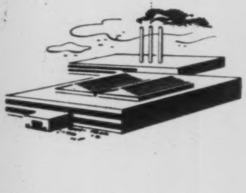
Letter from the Editor . . . . . . page 13
You'll Want to Know . . . . . . page 29

EFFECTIVE PENETRATION

in the industrial—large building field



True to its name, HEATING, PIPING & AIR CONDITIONING confines itself to these three services as related specifically to the industrial-big building field.

Result: a concentrated editorial content vital to ALL of the purchase-control factors in this market—the consulting engineers, mechanical contractors, and engineers with plants and big buildings who identifiably are responsible for this work. Individually, or in combination, they specify and/or buy virtually every product required.

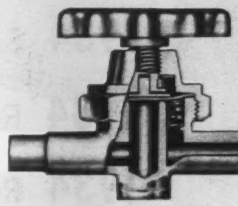
Alike in another respect, they form the reader-audience of HPAC. Each is, and has been, paying for it directly, individually, voluntarily. Here's assurance—backed up by dollars on the line and an ABC-audit—that HPAC is wanted, respected, and used!

Concentrate in HPAC, the book that ● has over 18,000 fully paid circulation ● leads in number of editorial pages ● leads by over 2 to 1 in advertising volume ● has more advertisers and is used exclusively by more advertisers. KEENEY PUBLISHING CO., 6 N. Michigan Ave., Chicago 2, Illinois.

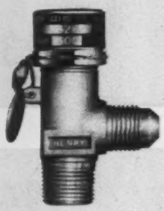
HENRY VALVE CO.

CONTROLLING FLOW
SINCE 1914

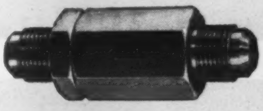
Every product bearing the name Henry carries with it complete assurance of on-the-job satisfaction. This quality of performance and the confidence it inspires have made Henry the most accepted line in the industry.



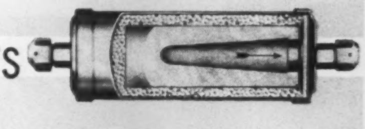
VALVES—Shut-off
Packless, Packed and Wing Cap Types



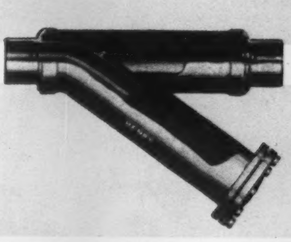
VALVES—Pressure Relief
Piston and Diaphragm Types



VALVES—Flow Check
Spring Loaded and Free Floating Types



FILTER-DRIERS & Driers
Sealed and Cartridge Types



STRAINERS—All Types
Sealed and Cleanable

HENRY VALVE COMPANY

For Refrigeration, Air Conditioning and Industrial Applications

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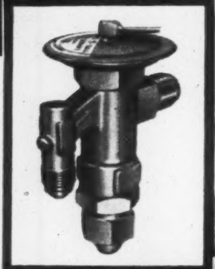
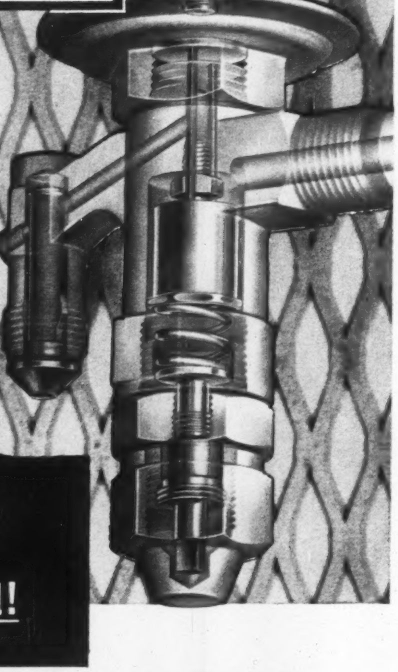
SPORLAN FAMOUS FIRSTS

...Thermostatic Expansion Valves



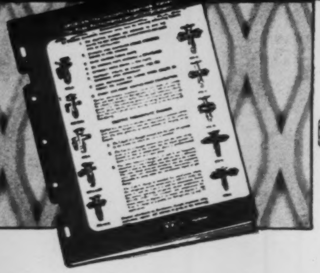
1934	Selective Charges
1934	Replaceable Power Element
1934	Replaceable Parts
1934	Solder Flange Bushings
1935	Flat Welded Diaphragm
1948	Flow Master Element
1951	Level Master Control

Modifications will always be made,
but always to improve the product . . . .
never to change it!

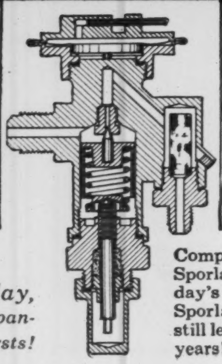


Basic in design...

Constantly Improved . . . but never changed!



Send for Bulletin 10-10 today, then order Sporlan Thermostatic Expansion Valves with all these famous firsts!



Compare this original Sporlan design with today's phantom above. Sporlan's basic design still leads after all these years!

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VALVE COMPANY
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Export Dept. 85 Broad St., New York 4, N.Y.

FLEXIFLO

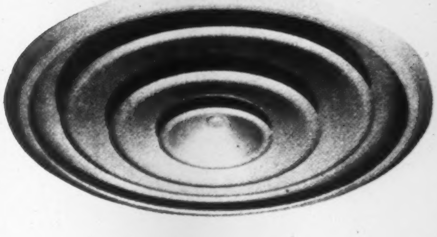
diffusers
registers
grilles

diffusers

QP series — four spun cones

Artistically contoured high aspirating diffusers available in four basic models with removable cores. Easy removal and installation is permitted with a three point snap lock arrangement designed to hold the core with rattle free rigidity.

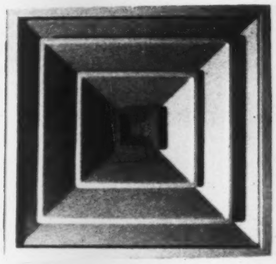
QP — Fully adjustable pattern from horizontal to vertical obtained by rotating the center cone.
QPF — Fixed horizontal pattern — may also be supplied as fixed downward pattern, preset at factory.
QPC — Fixed horizontal pattern — designed for surface mounting on ceiling or exposed ductwork—does not require ceiling opening larger than neck.
QPSR — Supply and return diffuser available with built in face operated supply air dampers.
Consult factory for deep outer cones available as special.



H series — round neck square diffuser

Square diffusers obtaining 360° air pattern either ceiling (C) or flush tile (T) installation available in three basic models all with removable cores.

HAV — Fully adjustable pattern from horizontal to vertical obtained by rotating the center cone.
H-F — Fixed horizontal pattern — also available as one, two, or three way blow diffuser.
HAR — Fixed horizontal pattern with adjustable effective area. Unique built in volume control feature allows volume adjustment without changing radius of diffusion. Equalizing deflectors are built into diffuser. Additional accesories are **not** necessary.

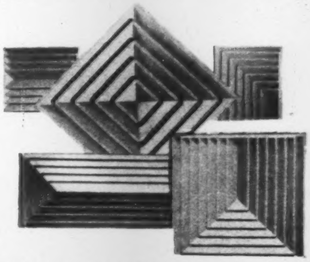


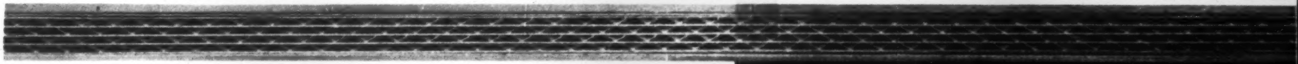
MP series — square or rectangular multi-pattern

NOW ALSO AVAILABLE IN EXTRUDED ALUMINUM

Manufactured in more than 18 different pattern styles the MP diffuser is particularly suited for installations which would otherwise require blanking baffles. MP diffusers can be used in the corner of a room, along a wall or in narrow corridors without creating drafty condition. They are also available for flush mounting in tile ceilings.

MPSR — Supply and return diffuser in any pattern.
MPV — With hinged flaps for adjustable deflection.
MPLF — Square or rectangular with lighting fixture.





LINE AIR — continuous strip air diffuser

Heavy gauge steel or ANODIZED EXTRUDED ALUMINUM

A slender continuous strip diffuser combining the graceful lines of modern architectural design with the most recent advances in air diffuser design. The air straightening and self balancing features of LINE-AIR makes unnecessary additional turning devices and allows long continous installation directly on the main supply trunk. LINE-AIR is supplied in steel as a standard or with narrow anodized extruded aluminum frames. Available in four basic face styles or combinations of face styles.

A — Straight blow type suitable for use as an air curtain under or over windows or installed on a wall.
D — Ceiling diffuser type available as one or two way or two way unequal blow. May also be used on a baseboard.
W — Angular blow type. May be used on ceiling to blow angularly down or on a wall to blow angularly up or down. Available as one or two way blow.
M — Short blow type. Installed in short lengths giving a spread blow with a shorter diffusion radius.

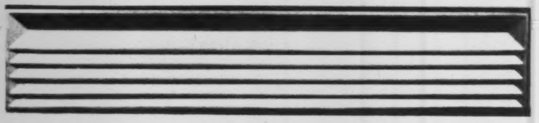
SPECIFIED FOR

- high side wall
- air curtains
- floor & ceiling
- sill top

UNIVERSAL DIFFUSER CORP.
TUCKAHOE, N.Y.

UNIVERSAL DIFFUSER CORP.

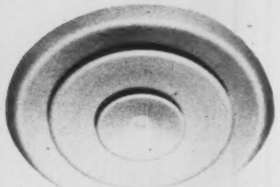
diffusers



MPL series — long slot type

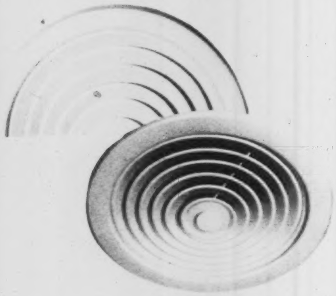
ALSO AVAILABLE IN EXTRUDED ALUMINUM

An adaptation of the MP diffuser and suitable for use as a continuous slot diffuser. The MPL is basically a ceiling diffuser but may also be used on baseboard installations.



B-C series — three spun cones

Attractively styled fixed air pattern diffuser designed for horizontal blow. Removable core with ingenious snap lock arrangement affords simple removal and installation with rattle free construction. May be installed on exposed ductwork without neck collars or surface mounted on ceilings.



R series — adjustable spiral
V series

All diffusers in this series have built in equalizing deflectors.

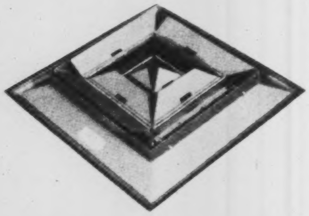
R — Constant Horizontal pattern with adjustable effective area. Unique built-in volume control feature allows change in volume without affecting the radius of diffusion.

V — Adjustable Pattern — From horizontal to full downblast. Multiplicity of rings makes it particularly adaptable for Unit Heaters. High effective area in full open position enables its use as a high volume diffuser with short radius of diffusion.

CH — Supply and Return

SC — Half round for ceiling application.

SW — Half round for wall application.



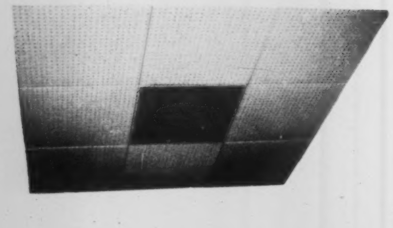
MPK series — four way adjustable

Four way blow MP diffuser with built in multiple blank off baffles individually adjustable to allow variable volume in EACH direction. Particularly suited to installations where air direction requirements may change after installation.

AUTOMATIC

Type R or HAR diffusers may be fitted with pneumatic air cylinders to obtain automatic volume control in response to a zone control thermostat without affecting the radius of diffusion.

Type V, HAV or QP may be fitted with air cylinders to obtain automatic seasonal changeover in response to a summer winter switch.



P series — perforated plate

PS — Five way adjustable. Built-in volume control.
Each 90° sector may be adjusted individually for volume & pattern deflection without interference with the other sectors. Hence this diffuser can be set as 1 way, 2 way, 3 way or 4 way blow full down blast or a combination of horizontal and down blow.

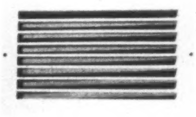
RP — Return air diffuser to match supply diffusers.

FP — Fixed horizontal pattern perforated diffuser.

UNIVERSAL DIFFUSER CORP.

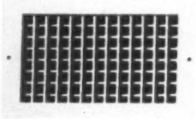
registers and grilles with extruded aluminum STREAM-FLOW blades

supply grilles



Single Deflection

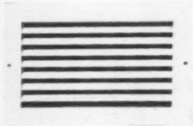
VEG Vertical Blades
HOG Horizontal Blades



Double Deflection

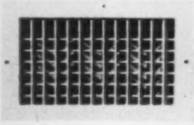
VEGD Vertical Face Blade
HOGD Horizontal Face Blade

supply registers with opposed blade dampers



Single Deflection

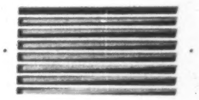
VER Vertical Blade
HOR Horizontal Blade

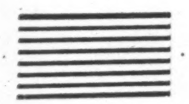


Double Deflection

VERD Vertical Face Blade
HORD Horizontal Face Blade

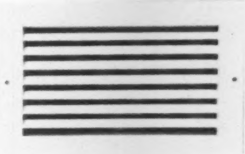
return grilles





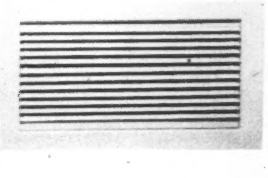
VEGF Fixed Vertical Blades
HOGF Fixed Horizontal Blades
HOGF-40 Fixed Horizontal Blades Set at 40° Angle

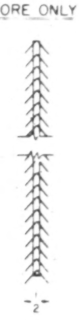
return registers with opposed blade dampers



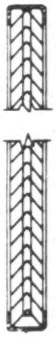
VERF Fixed Vertical Face Blades
HORF Fixed Horizontal Face Blades
HORF-40 Fixed Horizontal Face Blades Set at 40° Angle

door grilles

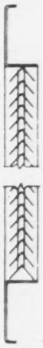




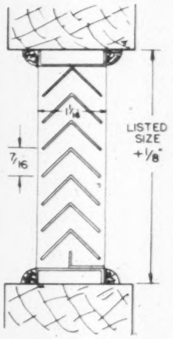
9A



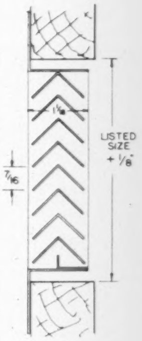
9B



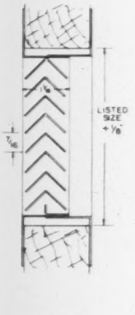
9C



900



901



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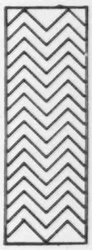
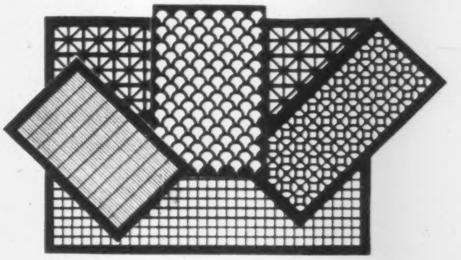


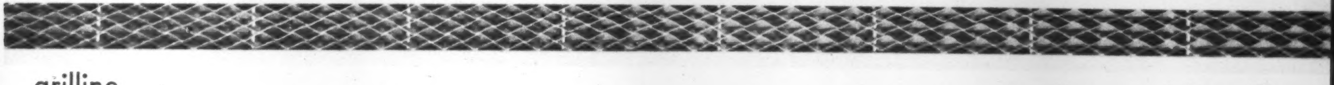
NO LITE

grilles & ornamental designs

#880 Plain Lattice Grilles
#850 Plain Lattice Face With Multi-blade Damper
#800 Plain Lattice Face With Opposed Blade Damper

Available in Steel, Aluminum, Bronze.





grilline

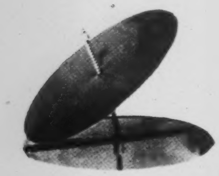
Grilline is the ideal return grille companion for Line-Air supply diffuser installations. May also be used over radiator enclosures or as a low velocity supply grille under windows.

continuous strip grille

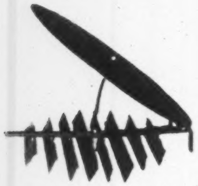
Grilline can be furnished pencil proof or reinforced for floor grille applications.

Also available in aluminum with Anodized Extruded Frame.

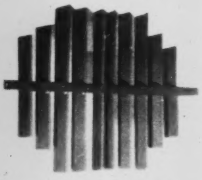
accessories



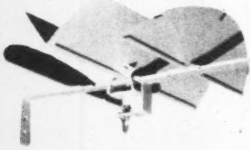
splitter damper
SD



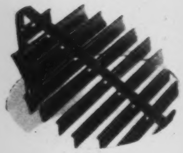
splitter damper combination
SDC



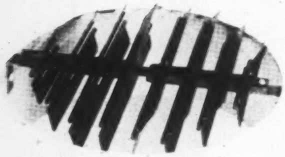
equalizing deflector
ED



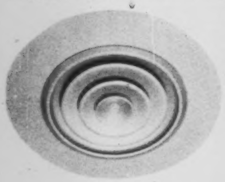
face operated
damper
RD



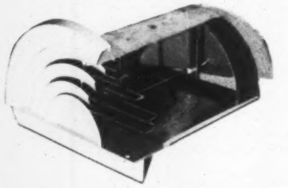
grid



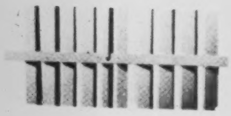
twintrol



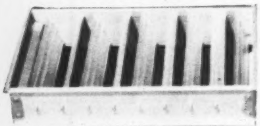
anti smudge ring



half round
splitter damper
SDH



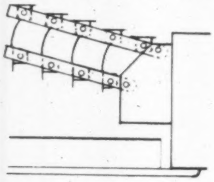
rectangular equalizing
deflector
MED



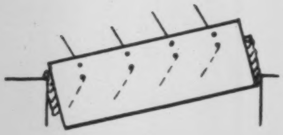
opposed blade
damper

OBD for registers — LSD for MP diffusers

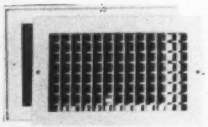
rectangular
PLACQUES



air extractor
XTROL



air controller
VOLTROL



plaster frame
PF

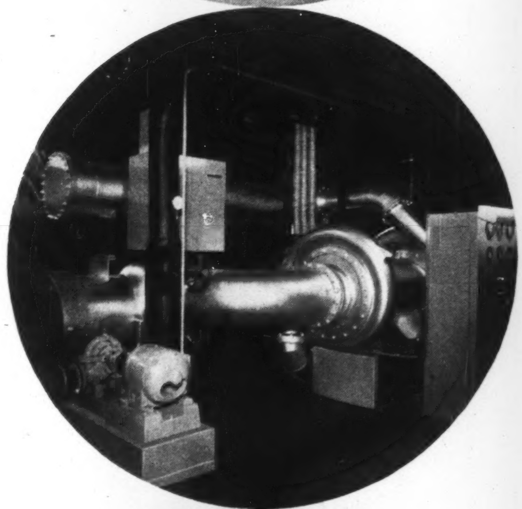
FLEXIFLO

UNIVERSAL DIFFUSER CORP.
[illegible]RBLEDALE ROAD [illegible]

REPRESENTATIVES

Some Territories
Available

INDIANA
NATIONAL
BANK



INDIANA NATIONAL BANK

New annex to Indiana National Bank, Indianapolis (Top Illustration)
Architect: D. A. Bohlen & Son. *Consulting Engineer:* Bevington, Taggert and Fowler. *Mechanical Contractor:* R. M. Cotton Company.

Climate by Chrysler

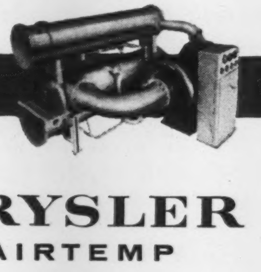
. . . cuts the cost of cooling two buildings for Indiana National Bank

The new 9-story addition to Indiana National Bank in Indianapolis is adjacent to an older 9-story bank annex which was already air conditioned. When the consulting engineers planned the cooling system for the new building, they came up with a unique way to cool *both* buildings with a Chrysler Centrifugal Liquid Chiller in the new addition as the basic unit . . . and bring the bank considerable savings in operating costs.

The new 218-ton Chrysler Chiller was also connected to the air handling equipment in the old annex. Thus, the new, extra-efficient unit operates under most economical conditions whenever air conditioning is needed in either building. The two units in the old annex are used only when additional capacity is simultaneously needed for both buildings.

What gives the Chrysler Centrifugal Chiller its extra efficiency? The exclusive true volute casing design is the answer. It delivers more tons of air conditioning per motor horsepower. (Or, if you wish, you can get a given tonnage with a smaller, less expensive motor—and save money on initial cost and operating expense.)

No matter how large or complicated the air conditioning job, Climate by Chrysler can be custom-engineered to your exact requirements. For complete information, or technical assistance, contact your local Chrysler Applied Machinery and Systems sales office.



CHRYSLER
AIRTEMP

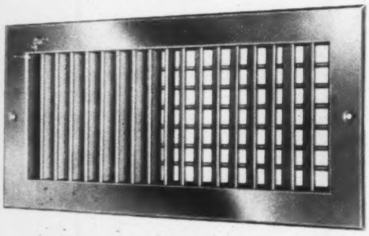
Airtemp Division, Chrysler Corporation, Dept. Y-10, Dayton 1, Ohio
In Canada: Therm-O-Rite Products, Ltd., Toronto, Ontario

WATERLOO

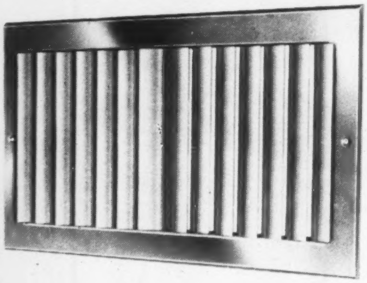
Airline Grilles

Waterloo Offers a Complete Line

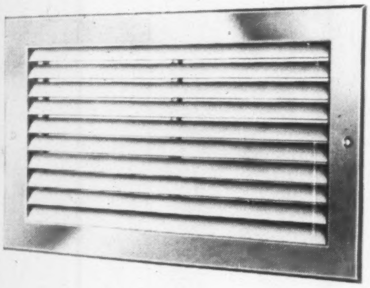
TYPICAL WATERLOO UNITS:



WATERLOO
SUPPLY
GRILLES
★
MODEL
2V



WATERLOO
CURVED
LOUVER
GRILLES
★
MODEL
1 CV2



WATERLOO
RETURN AIR
GRILLES
AND
REGISTERS
★
MODEL
3HD

All Extruded Aluminum Units for Floors, Sills and Walls

Streamlined Waterloo *Airline Grilles* fit perfectly into modern architectural and engineering concepts. These extruded aluminum grilles, available up to 12 feet in length in one piece construction, are excellent for every type of floor, sill and wall application.

Designed to match a wide range of architectural finishes, Waterloo *Airline Grilles* feature a unique bar-support method that makes them practically tamper-proof. Since these units are designed with ¼″ face bars on ½″ centers, they are heel and pencil proof.

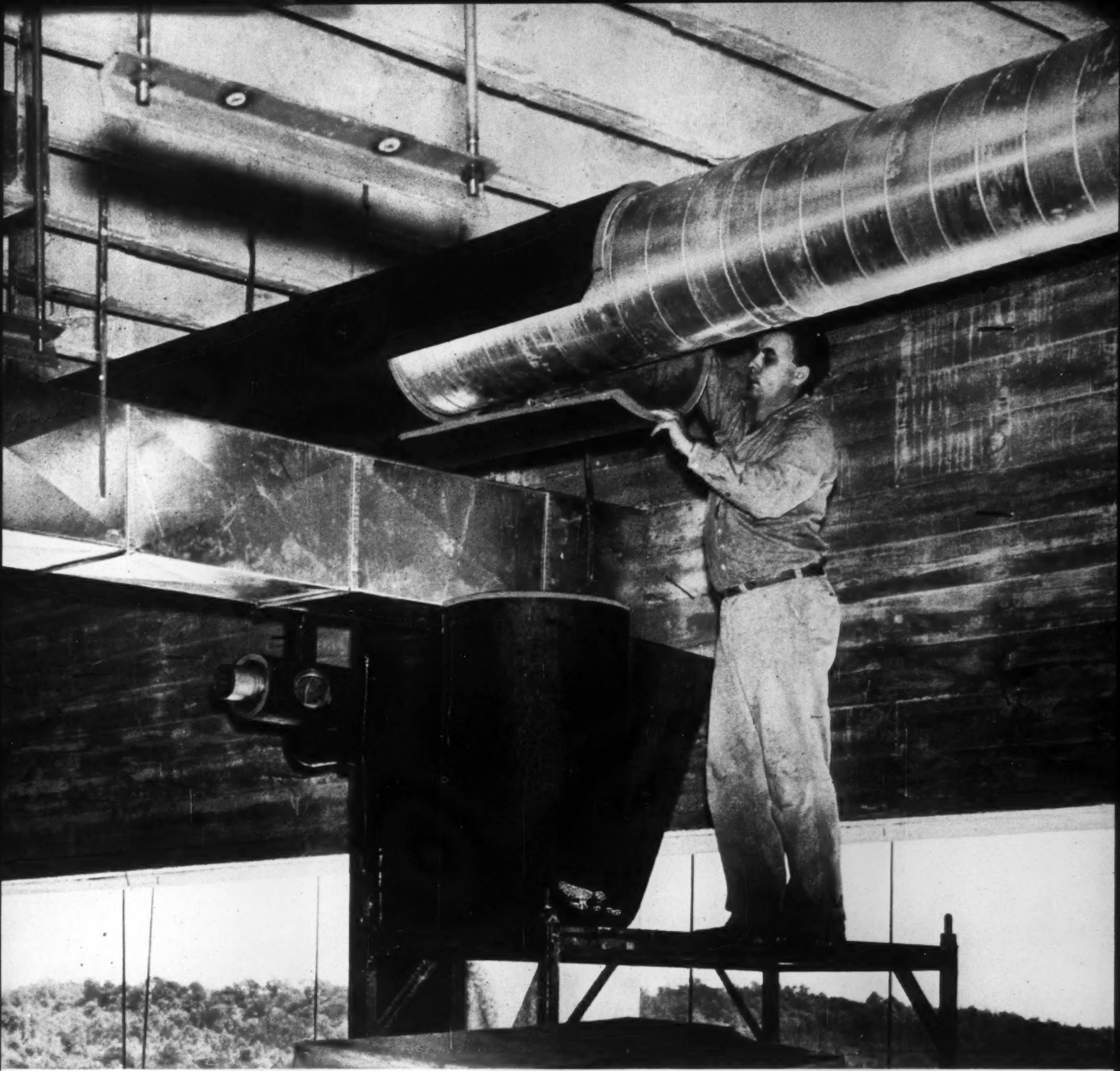
Write for comprehensive Selection Guide on these new multi-purpose Waterloo Grilles.

WATERLOO
Air Diffusion
EQUIPMENT

TESTED · APPROVED · AIR DIFFUSION COUNCIL · CORPORATION OF AMERICA
A

WATERLOO REGISTER COMPANY, INC.
P.O. BOX 72, WATERLOO, IOWA

WR 119



New Idea!...

G-B SNAP*ON®

for high velocity

duct systems

Snap! . . . . and 3 feet of duct is insulated, when you use G-B SNAP*ON, the one-piece insulation molded of fine glass fibers. Just spread the single seam . . . snap the 3 foot section over the duct . . . seal the vapor barrier seams . . . and that's *that.*

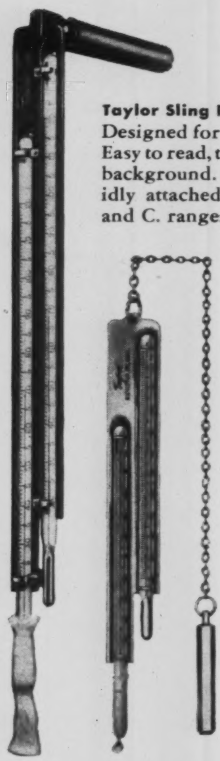
For many of the same reasons that have made G-B SNAP*ON the preferred pipe insulation, it is becoming increasingly popular for high velocity circular ducts. You can see at a glance how much time it saves. The finished job is neat in appearance and absolutely uniform in thickness —no bulges, no thin spots. Most important, G-B SNAP*ON's thermal efficiency is both outstanding and permanent, assuring economy of operation for the lifetime of the air conditioning system.

YOUR NEARBY G-B SNAP*ON
DISTRIBUTOR IS LISTED IN
THE YELLOW PAGES

GUSTIN-BACON *Manufacturing Co* GUSTIN gb® BACON

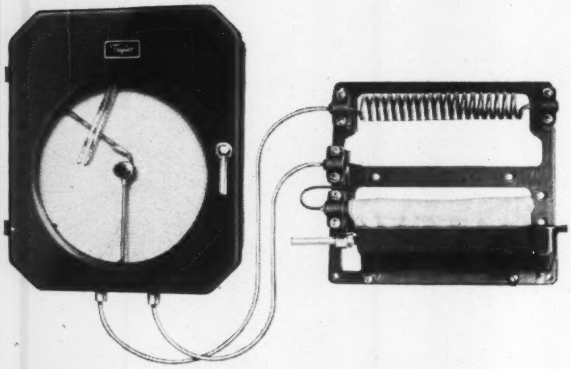
220 W. 10th St., Kansas City, Mo.

Thermal and acoustical glass fiber insulations . . . Molded glass fiber pipe insulation
Couplings and fittings for plain and grooved end pipe



Taylor Sling Psychrometer
Designed for simple, accurate operation. Easy to read, thanks to translucent golden background. Folding swivel handle rigidly attached to metal back. Several F. and C. ranges.

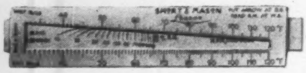
PocKet Sling Type Psychrometer
Sturdy metal mounting only 5″ long for convenience, with sturdy chain and handle. 1° divisions range from 20° to 120°.



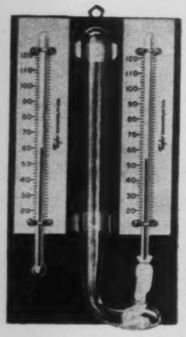
Recording or Recording-Controlling Hygrometer
With bottle or continuous water feed, for applications with good air circulation, where panel is located within apparatus room or duct for best circulation across the bulbs. Or with suction fan where circulation is poor.

Is it the HEAT or the HUMIDITY?

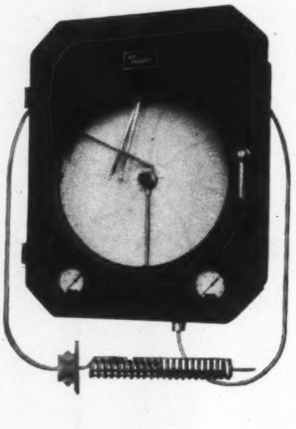
Whatever your recording or control problem, you can rely on Taylor instruments like these. They're accurate, rugged, dependable. For detailed information ask your Taylor Field Engineer or write Taylor Instrument Companies, Rochester, N.Y., and Toronto, Ont.



Hygrorule
Does away with need for cumbersome tables by translating wet and dry bulb readings into relative humidity values within 1% of table readings. One side calibrated for sling psychrometers, the other for still-air hygrometers. 6″ long, leather case.



Mason's Form Hygrometer
For wall mounting in office, factory or home. Range from 30° to 220° with black markings on white scale, 8½″ x 4½″, mahogany or gray metal mounting.



Taylor FULSCOPE*
Temperature Controller
Keeps damper motors and diaphragm valves at proper openings for perfect functioning of your air conditioning system. Automatically compensates for load changes. Gives automatic seasonal changeover.

*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

"Best valve made for air conditioning!"

ACF® Plug Valves

ACF lubricated plug valves give positive control at minimum expense for air handlers, compressing units, natural gas or fuel oil lines, and water towers.

No matter how long between operations, ACF plug valves open and close with an easy quarter-turn. Friction surfaces are constantly lubricated for smooth turning and protection against corrosion. A teflon gasket backed-up by a lubricant reservoir seals the head seat. The cylindrical plug — with a well-proportioned full pipe area port — provide an effective seal in the line.

Next time — and every time — specify ACF! *Available from leading suppliers everywhere.*

WRITE FOR BULLETIN AP-1059

Dial Indicator for Balancing Rectangular, Diamond or V Ports

All ACF Plug Valves may be equipped with dial indicators, which save time and inconvenience in recovering proper balance in air conditioning systems.

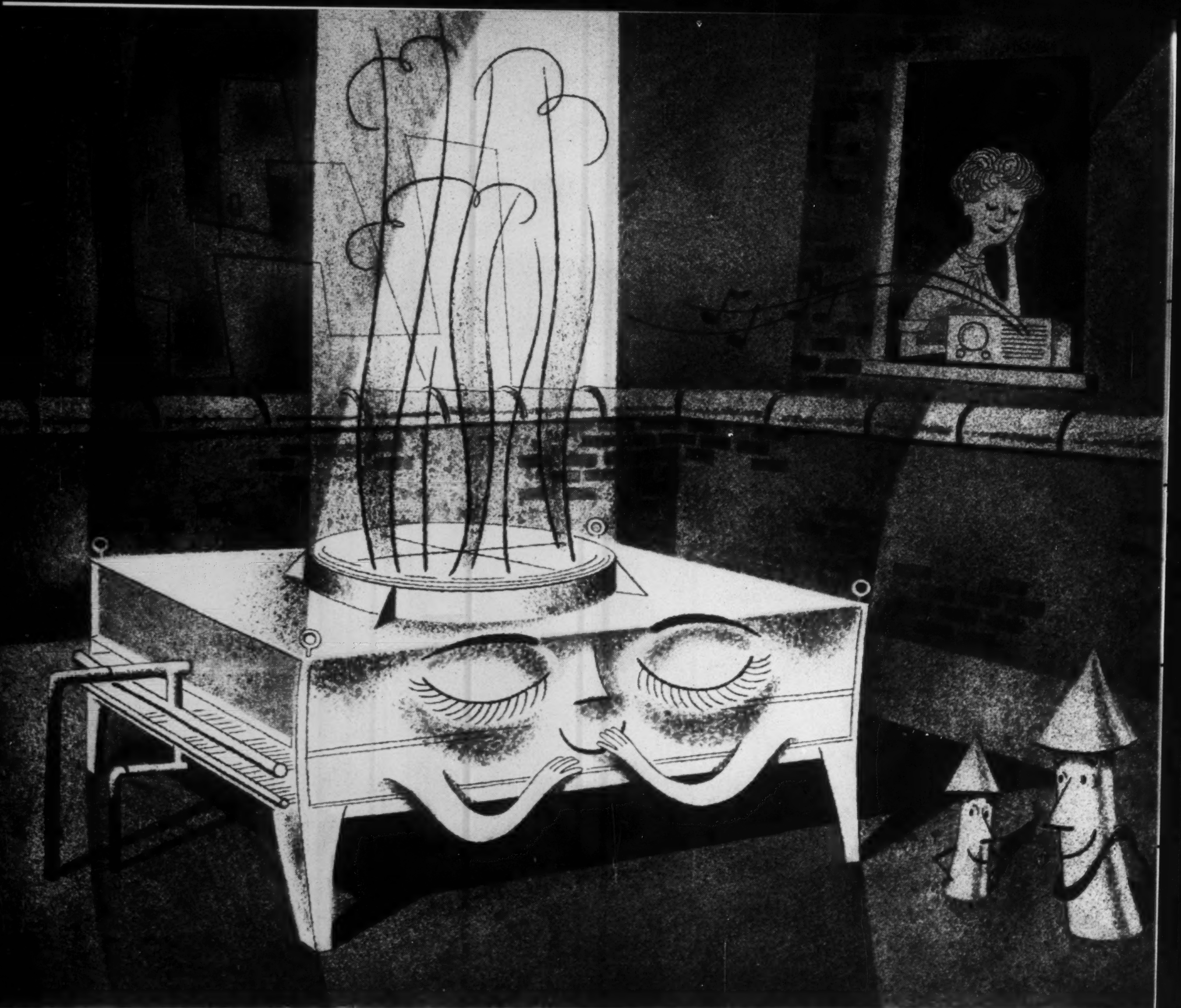
In addition to the popular rectangular port, ACF Plug Valves are also available in diamond and V port models for even more accurate flow control.

Product of W-K-M's
Creative Engineering

W-K-M

DIVISION OF ACF INDUSTRIES
INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

5924



Ever hear of a bashful air-cooled condenser?

Check the new Halstead & Mitchell vertical air flow condenser

ACV SERIES —
5 TO 100 TONS

H&M's new ACV Air-Cooled Condenser with vertical air flow hates to be showy. It's so low and so quiet, you hardly know it's there—very appealing to owners, their neighbors, architects and engineers!

Roof loading is low, too, and air flow noise is directed away from surrounding structures. This delights building owners and tenants alike.

Vertical air flow models are available in 5 to 100 tons. And like all H&M Air-Cooled Condensers, the ACV series features exclusive Turbu-Flo fins, spaced wide to prevent clogging by air-borne dirt. Multiple circuiting is available for your specific needs *at no extra cost.*

Get the whole story on H&M Air-Cooled Condensers—with propeller or centrifugal fan. Ask your refrigeration wholesaler for a copy of the new bulletin AC-102. Or write to Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.

Air-Cooled Condensers • Finned Coil Products • Water-Cooled Condensers • Cooling Towers

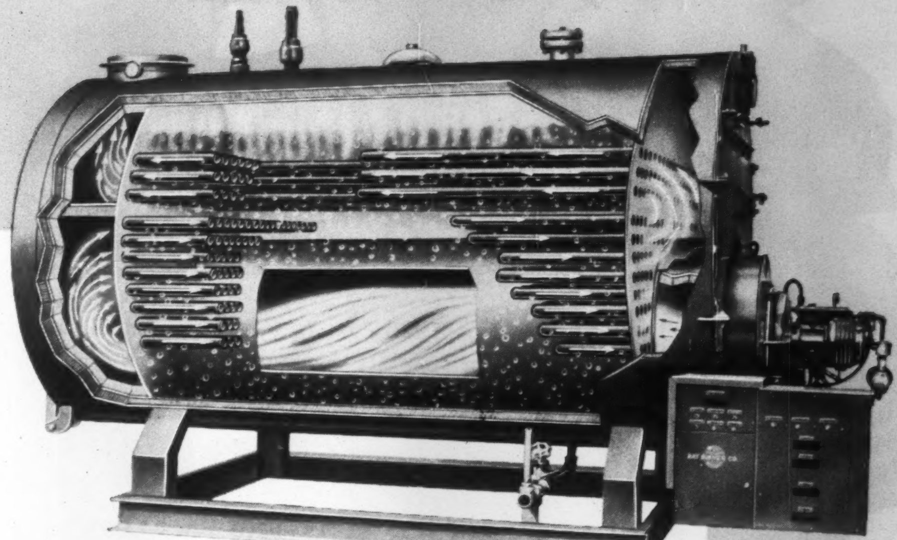
HM

Halstead & Mitchell

Send for up-to-date information on

WEBCO-RAY

3 pass packaged units



- **80 plus percent efficiency**
- **Forced Draft and Pressure Forced Draft models**
- **Sizes from 10 to 600 hp**
- **Factory packaged for fast hook-up**
- **Hinged front doors for easy maintenance**

Webco-Ray three-pass packaged heating, power or process steam units offer optimum efficiency and performance at low cost. Boilers by Webco, feature large furnace volume for high radiant heat transfer, longer life, low maintenance and quiet operation. World famous Ray burners are standard equipment on all Webco packaged units, guaranteeing reliable, economical combustion. Other advantages of Webco-Ray units include: hinged front doors and a rear access door for easy maintenance; complete factory-packaging for economical hook-up on the job; and fast local service from the Ray and Western dealer network.

WEBCO·RAY
PACKAGED BOILERS

WESTERN BOILER COMPANY
1600 North Indiana Street, Los Angeles 63, California
1309 Eighth Street, North Bergen, New Jersey

CALL OR WRITE FOR COMPLETE CATALOG ON WEBCO-RAY UNITS

Western Boiler Company
1600 North Indiana Street, Los Angeles 63, California
1309 Eighth Street, North Bergen, New Jersey

Name______________________________

Company______________________________

Address______________________________

City____________________State________

HEAD
160'
86'
30'
20'
GPM
128
170
1650
1900

QUIET...

ON SMALLEST TO LARGEST *Hydronic** JOBS

B&G circulating pumps, from the 1/12 HP Booster to the new 40 HP Universal are specialized units! They are designed and built specifically to serve the exacting needs of circulated water heating and cooling systems...ideal for applications of the B&G-developed principle of primary and secondary pumping.

Quiet, vibrationless operation is the outstanding characteristic of B&G pumps. They can be installed without expensive flexible connections or noise dampeners of any kind.

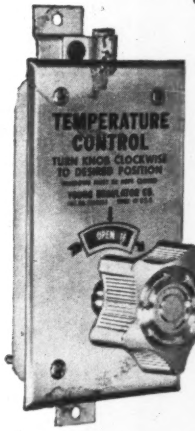
Among the features which assure both quiet operation and long-lived dependability are specially built, more costly motors, tested for quietness—oversized shafts of hardened alloy steel—long sleeve bearings—noise dampening spring couplers—oil lubrication and leak-proof mechanical seals.

That's why B&G Circulating Pumps, small or large, are *preferred* ...they're *quiet where silence is a "must"!*

**Hydronics: The science of heating and cooling with water.*

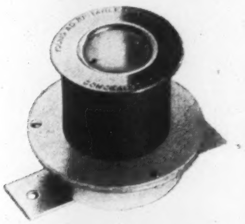
BELL & GOSSETT
COMPANY
Dept. FT-5A, Morton Grove, Ill.
Canadian Licensee: S.A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto, Ontario

Young regulators and controls have been specified by architects and engineers for over 30 years. In addition to those units shown here Young Regulator Company has a complete line of regulators, dampers, grilles and registers for heating and air conditioning installations.


TEMPERATURE CONTROL
TURN KNOB CLOCKWISE TO DESIRED POSITION
YOUNG REGULATOR CO.
OPEN

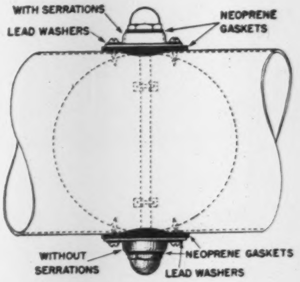
Remote Control Regulators

Model 700A, illustrated here, operates dampers and registers manually and gives individual room temperature by remote control. Using Corner Pulleys, Young Remote Control Regulators operate dampers at distances up to 250 feet.



Floor Line Adjustable Cover Regulator

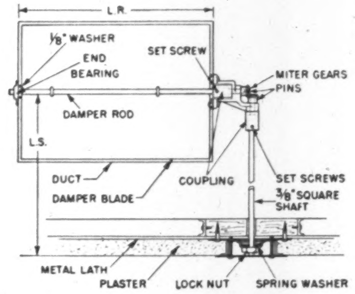
This Model 330 Regulator is designed for perimeter heating and cooling. It is placed in the floor near a grille and gives accurate control of the volume of air in a branch duct.


WITH SERRATIONS
LEAD WASHERS
NEOPRENE GASKETS
WITHOUT SERRATIONS
NEOPRENE GASKETS
LEAD WASHERS

High Pressure System Regulator

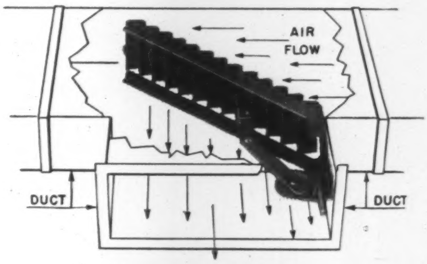
Model 409RD Damper Regulator, with 419RD End Bearing, can withstand pressures in excess of 50 psi. This unit is designed for round ducts 4" to 8" in diameter, which carry high pressures or low vacuums. Other models for rectangular ducts or round ducts over 8" in diameter.

Young
REGULATORS and DAMPERS
The Name You Can Trust


L.R.
1/8" WASHER
END BEARING
SET SCREW
MITER GEARS
PINS
DAMPER ROD
L.S.
DUCT
DAMPER BLADE
COUPLING
SET SCREWS
3/8" SQUARE SHAFT
METAL LATH
PLASTER
LOCK NUT
SPRING WASHER

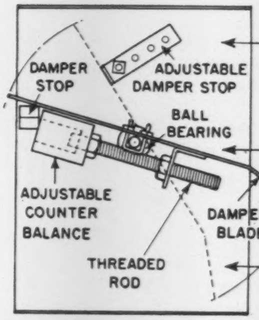
Concealed Butterfly Damper Regulator

Installation of Young Concealed Butterfly Damper Regulator is shown above. Model 927 has cut steel gears and is used for torque loads up to 800 inch-lbs. Model 927A has die cast gears and is used where torque loads do not exceed 150 inch-lbs.


AIR FLOW
DUCT
DUCT

Air Extractors

Model 890 Air Extractor scoops the desired amount of air from the main duct into a branch duct. Blades operate in unison and the supply of air is uniformly distributed. Sizes range from 8" x 4" to 40" x 12".


DAMPER STOP
ADJUSTABLE DAMPER STOP
BALL BEARING
ADJUSTABLE COUNTER BALANCE
DAMPER BLADE
THREADED ROD

Pressure Relief Dampers

Model 818 installation, shown above, operates damper automatically. It is adjustable to pressure required for closing the damper by moving counter balance weight. Shaft can be adjusted to open at low velocity of 150 f.p.m. and close it at 200 f.p.m.

See our complete catalog in Sweet's Architectural File or in the Engineers' Product File

YOUNG REGULATOR COMPANY

20910 Miles Avenue
Cleveland 28, Ohio

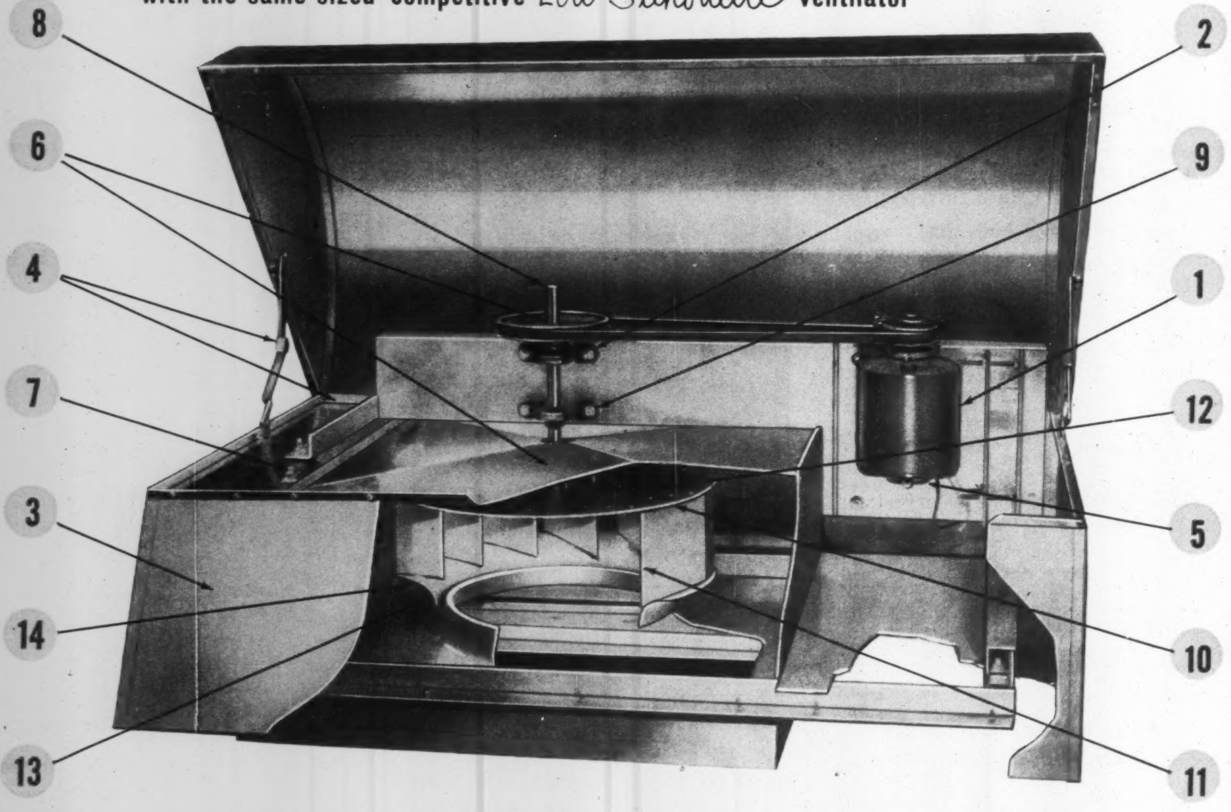
YR

PRODUCTS OFTEN LOOK

...but it's what's under the

Make this comparison of **CONSTRUCTION FEATURES**

with the same sized competitive *Low Silhouette* **ventilator**



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COMPARE CARNES MODEL LS-22	yes	yes	yes	yes	yes	yes	yes	1 3/16"	1 3/16"	22"	.102	.187	.125	yes
WITH THIS SIZE 22 COMPETITIVE UNIT	NO	NO	NO	NO	NO	NO	NO	¾"	¾"	21"	.050	.099	.063	NO

*Tests indicate that on a normal load of 200 lbs. rubber in shear vibration mountings have up to 500% more deflection than rubber in compression mountings.

Note the comparison on
14 IMPORTANT CONSTRUCTION FEATURES—
assuring long, trouble-free service

1. Motor out of the airstream.
2. Pillow blocks and bracket out of airstream.
3. All sheet metal parts of galvanized metal.
4. Hinged motor hood with supporting brackets.
5. Built-in thermal overload protection on single phase motors through 1 HP.
6. Fan wheel and driven sheave keyed to fan shaft.
*7. Floating vibration isolators in shear.
8. Fan wheel shaft size.
9. Pillow block size.
10. Wheel diameter.
11. Metal thickness—fan blades.
12. Metal thickness—fan back plate.
13. Metal thickness—fan side plate.
14. Spun inlet on fan wheel.

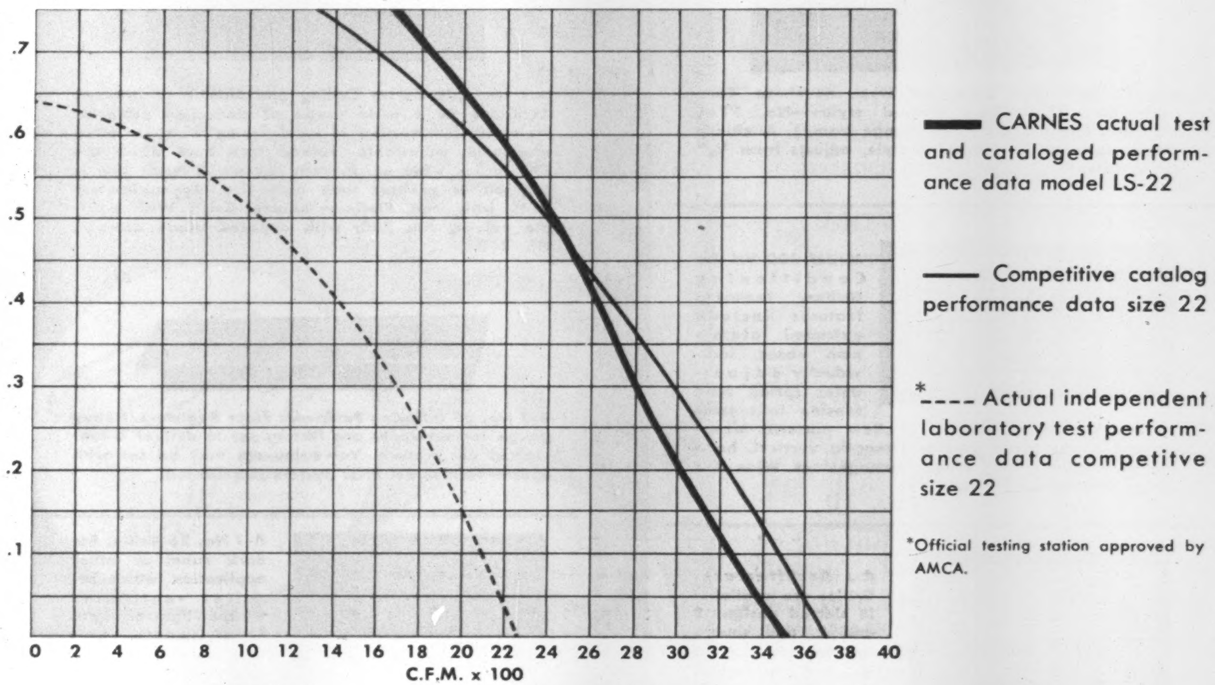
ALIKE

shell that counts!

Make this comparison of **TEST PERFORMANCE**

with the same sized competitive *Low Silhouette* ventilator

CARNES MODEL LS-22 and competitive Size 22—both corrected to 750 R.P.M.



CARNES Certified **AMCA** Rating 100% GUARANTEED

	AMCA	SEAL OF PERFORMANCE
CARNES MODEL LS-22	YES	Carnes Performance and Catalog Data guaranteed.
COMPETITIVE SIZE 22	NO	Catalog Data Over Rated up to 65% at free air, 130% at ½" static, to 540% at ⅝" static when tested in accordance with AMCA code.

Don't Gamble on Performance...Specify the AMCA label!

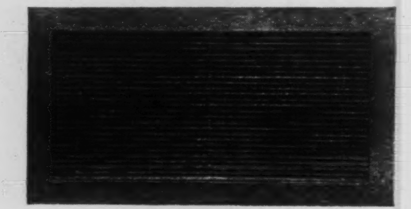
the new

CARNES LS POWER ROOF VENTILATORS

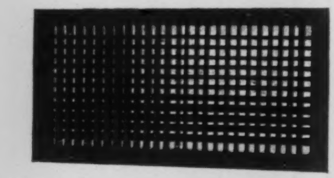
are far ahead in quality and performance

CARNES CORPORATION *Verona, Wisconsin*

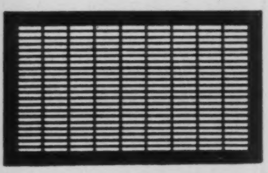
FOR EVERY HEATING AND AIR CONDITIONING NEED



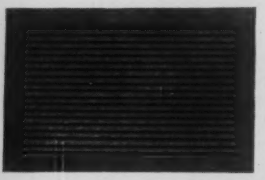
No. 77 Thin Core Grille. **All steel, no-vision. Core only—No. 77-C. Two framed styles—No. 77-A (channel frame); No. 77-B (flange frame). Auxiliary frame optional for No. 77-B style, adjusts from ¼" to ¾" depth.**



Model 400 VH Air Conditioning Grilles. **Exclusive features include extruded aluminum vanes, individually adjustable; spring load tension foils tampering, accidental change of flow pattern; wrap-around frame gives greater strength; vertical, horizontal or combination louver arrangement. Wide size range available.**

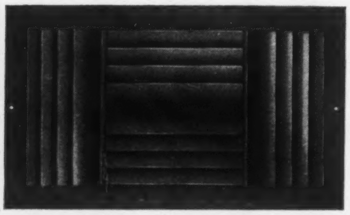


A-J Architectural Grilles **are available in slotted designs B and C, and square meshes of ½, ⅝, ¾ and ⅞ inches. The grilles can be made to your exact order from steel, aluminum, bronze, monel or stainless. There is practically no size limitation. See A-J illustrated catalog for specifications.**



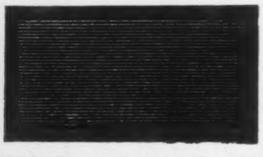
A-J No. 42 Series Return Air Grilles. **Available with either horizontal (42-H) or vertical (42-V) face bars on ½ inch centers, 45° deflection for minimized see-through. Depth 13/16 inch. All steel, gray prime finish. No. 432 has multiple valve body, removable handle; with opposed blade damper, No. 442.**

REGISTERS
GRILLES
DIFFUSERS
ACCESSORIES



A-J No. 200 Series Ceiling and Side Wall Diffuser. **Available in a wide range of deflection patterns. Standard construction is steel frame with extruded aluminum, adjustable, curved face bars which are 1¼ inches wide on ¾ inch centers. Overall size is 1¾ inches greater than duct size. Approximately 75% free area. Platinum enamel finish. With multiple valves, No. 230; with opposed blade damper, No. 240.**

A-J No. 55 Diffusing Perimeter Floor Registers. **Heavy gauge curved vanes are factory set to deliver a fan-shaped air pattern. Valve louvers may be set with special lock screw after system is balanced.**



A-J No. 75 Grille. **For dark room or other application which requires ventilation without light or sight. Steel construction throughout. Free area approximately 60%. With flange frame. No. 75-B; with channel frame, No. 75-A Depth of No. 75-B grille, 1¾ inches. Spans 3⅛ inches with standard auxiliary frame. Non-specular black only.**

See us at Booth 1100
2nd Southwestern Heating and Air-Conditioning
Exposition, Dallas, Texas February 1-4

A·J Manufacturing Co.

Dept. H-1
3601 East 18th Street
Kansas City 27, Missouri

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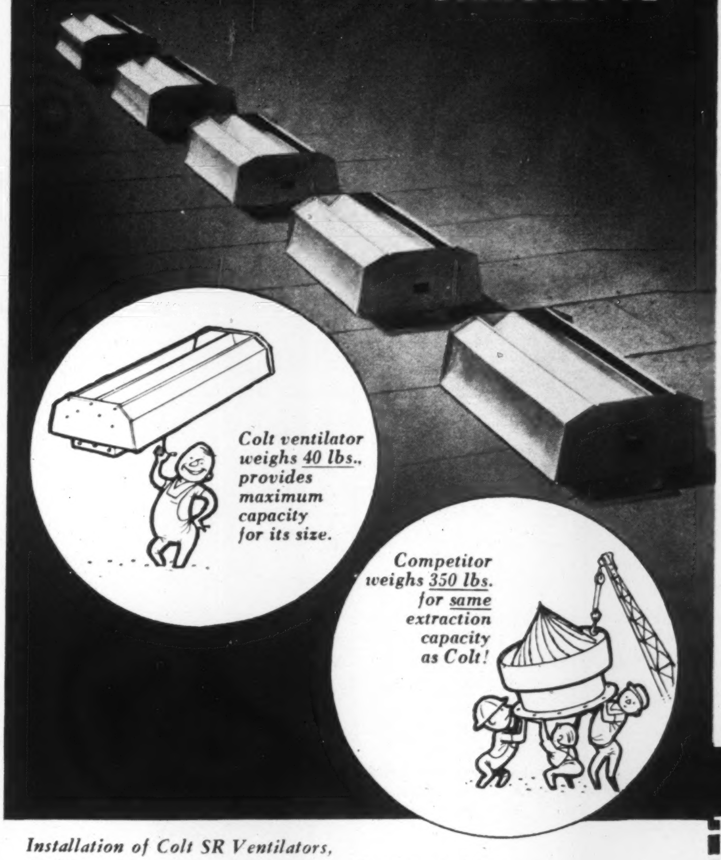
... with the LOW SILHOUETTE



Colt ventilator weighs 40 lbs., provides maximum capacity for its size.

Competitor weighs 350 lbs. for same extraction capacity as Colt!

Installation of Colt SR Ventilators,
DRAY Manufacturing Company, Inc. Downey, California.

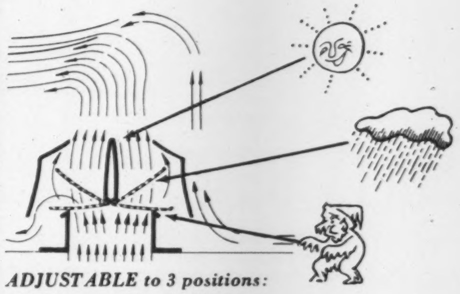
SPECIFY COLT

Improved employee comfort invariably leads to more production and bigger profits. Now the new *Colt O/SR* natural gravity ventilator adds a full 25% more extraction capacity—without motors or running costs. Get the Colt story today!

AIR FOIL DESIGN reduces drag and produces maximum extraction rate.

FITS ANY ROOF with unobtrusive low silhouette, in skylight pane or rectangular hole on any size roof.

LIGHTWEIGHT, of anti-corrosive aluminum alloy, no strain on roof.



ADJUSTABLE to 3 positions:
(1) wide open for hot days,
(2) partially open for normal days,
(3) fully closed for cold days.
RAINPROOF in normal or closed positions.

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ADDRESS ____________________
CITY __________ *ZONE* ___ *STATE* ________
TELEPHONE ____________________ H.P.A.

New COLT O/SR NATURAL GRAVITY VENTILATOR

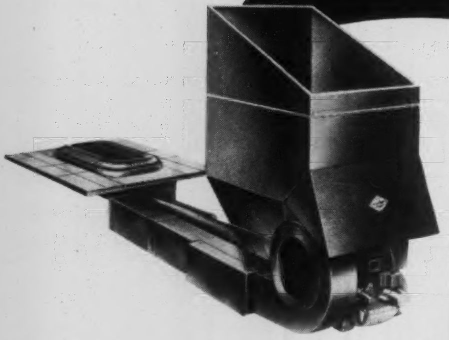
COLT VENTILATION OF AMERICA, INC.

4652 Hollywood Boulevard • Los Angeles 27, California • NO 2-1181

WILL-BURT STOKERS

for institutional, commercial, and industrial buildings

CAPACITIES 65 through 750 lbs. per hour



HOPPER MODELS — BIN FEED MODELS — Refractory or Deadplate Types

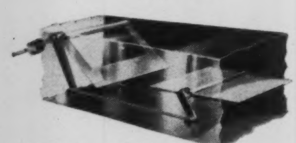
Complete drawings, dimensions, suggested specifications, and typical installation drawings are provided in Will-Burt Reference Manual 30-G-3. The manual, including stoker layout tracing templates, sent on request. Suggested installation drawings and wiring diagrams are supplied on request by our engineering department.

CONDENSED DATA — WILL-BURT HOPPER AND BIN FEED MODEL STOKERS

STOKER NUMBER		65	75	100	125	151	150	200	250	300	350	400	500	600	750
Coal Burning Rate (Approximate Lbs. Per Hr., Continuous Operation)		26	30	40	50	60	60	80	100	120	140	160	200	240	300
		45	50	70	88	105	105	140	175	210	245	280	350	420	525
		65	75	100	125	150	150	200	250	300	350	400	500	600	750
Steam Radiation		2110	2435	3250	4375	5250	5250	7000	8750	10500	12250	14000	17500	21000	26250
Water Radiation		3380	3900	5200	7000	8400	8400	11200	14000	16800	19600	22400	28000	33600	42000
Gross Output 1000's B.T.U. Per Hr.		507	585	780	1050	1260	1260	1680	2100	2520	2940	3360	4200	5040	6300
Boiler H.P.		15.1	17.5	23.3	31.4	37.6	37.6	50.2	62.7	75.3	87.8	100	125	150	188
Combustion Volume Min. Cu. Ft.		13	15	20	25	30	30	40	50	60	70	80	100	120	150
Setting Height Min. In.	Steel Boiler	23	24	27	28	28½	28½	30	31½	33	34½	36	39	42	46½
	Cast Iron Boiler	20	21	23½	24	25	25	26¼	27½	29	30	31½	34	37	40½
Motor H.P. Hopper Model		⅓	⅓	½	½	¾	¾	¾	1	1	1½	2	2	3	5
Motor H.P. Bin Feed Model	Power Unit	¼	¼	¼	¼	⅓	⅓	⅓	½	½	½	½	¾	¾	1
	Fan	⅓	⅓	⅓	⅓	½	¾	¾	¾	¾	1	1½	1½	2	3
Hopper Capacity		600	600	600	600	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200
Fan Capacity C.F.M.		660	660	1320	1320	1320	1405	1405	1875	1875	2720	2720	2720	2720	4080
Coal Screw Diameter		3 5/16	3 5/16	3 5/16	3 5/16	3 5/16	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
Coal Screw Removal	Std. Hopper Model, Min. Clearance Req'd., Inches	25	26	28	30	15	15	15	15	18	20	20	23	26	44
Weight Crated Lbs. Standard Hopper Model	Refractory	760	810	850	900	1020	1470	1470	1500	1680	1750	1750	1810	1840	2005
	Dead Plate	—	—	—	1040	1160	1760	1760	1805	2000	2210	2210	2380	2440	2670
Weight Crated Lbs. Standard Bin Feed Model	Refractory	800	850	900	950	980	1590	1590	1650	1830	1900	1900	1960	2010	2070
	Dead Plate	—	—	—	1090	1120	1880	1880	1955	2150	2360	2360	2530	2610	2735

Load values given are based on over-all boiler and stoker efficiencies of 65%, to and including 100 lbs. per hr., and 70% for those stokers over 100 lbs. per hr. capacity, using coal with heat value of 12,000 B.T.U. per lb.

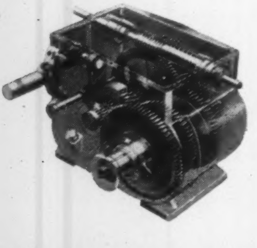
AUTOMATIC AIR CONTROL

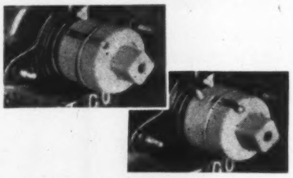


Infinitely sensitive to fuel bed air requirements—eliminates need for manual air adjustments.

3-FEED POWER UNIT

Continuous, satisfactory service of Will-Burt Transmissions of this same design for over twenty years is proof of their dependability.



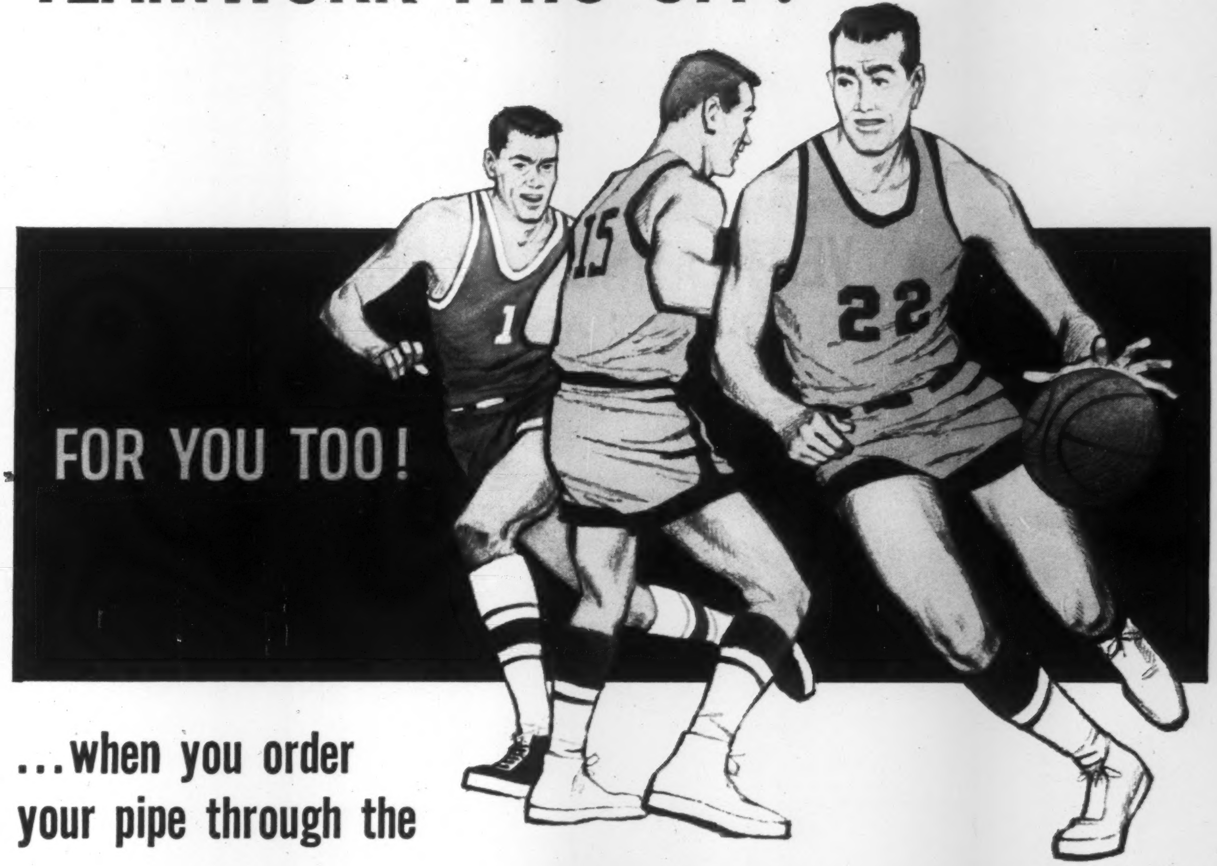


SAFETY SHEAR PIN DISCONNECT

Protects against overload — pin easily replaced, service quickly restored.

THE WILL-BURT COMPANY • ORRVILLE, OHIO, U.S.A. • *Over 28 years in the stoker business*

TEAMWORK PAYS OFF!



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IN U.S.A.

You can be sure this winning combination will supply you with steel pipe of unvarying high quality, job after job. And your Wheatland distributor sees to it that you get the pipe you need . . . on time!

See your Wheatland Pipe Distributor for black or galvanized Wheatland Steel Pipe.

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WHEATLAND STEEL PIPE

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IF YOU *EXHIBIT* AT THE
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VENTILATING AND REFRIGERATION
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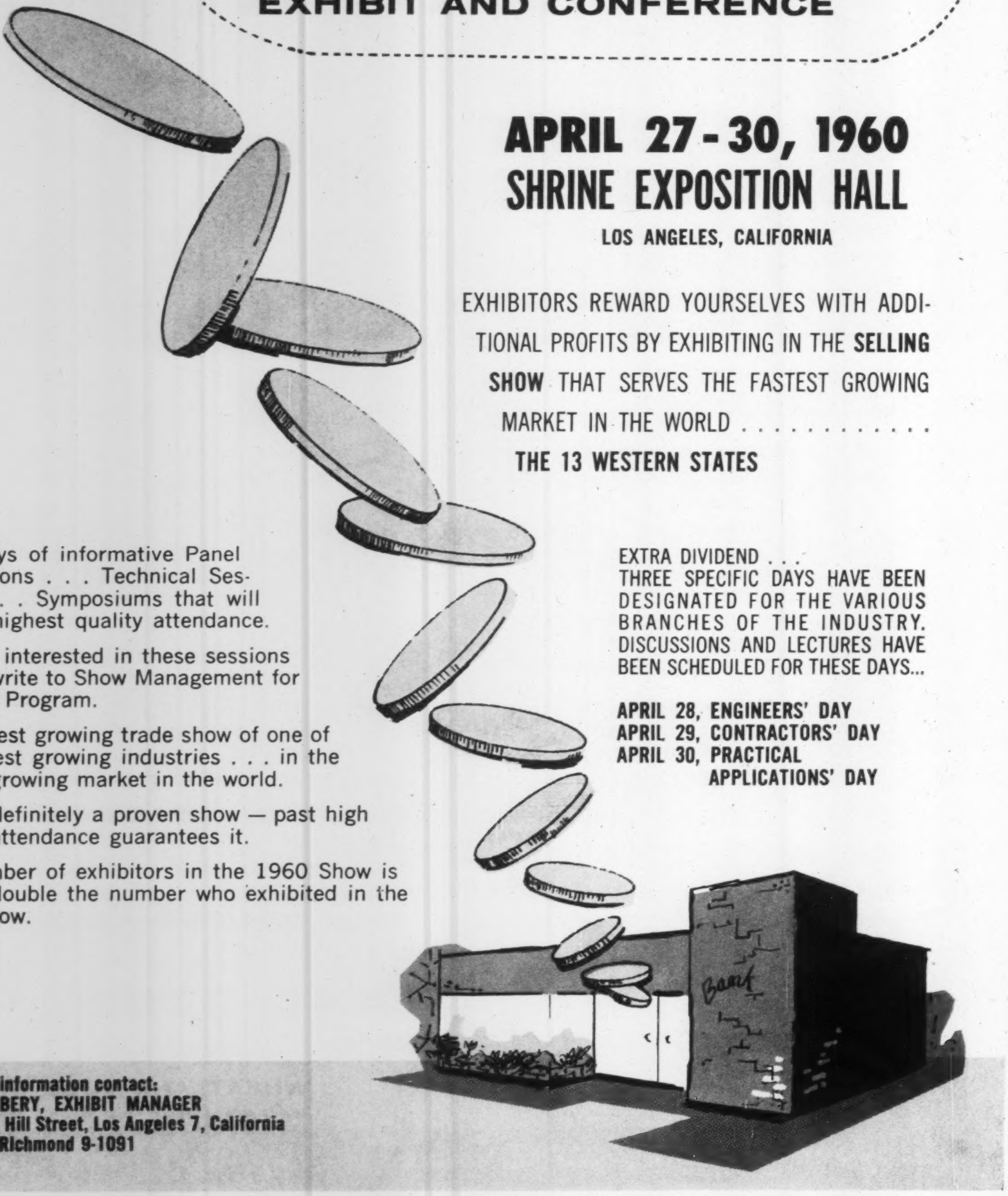

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THREE SPECIFIC DAYS HAVE BEEN DESIGNATED FOR THE VARIOUS BRANCHES OF THE INDUSTRY. DISCUSSIONS AND LECTURES HAVE BEEN SCHEDULED FOR THESE DAYS...

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FOR 150 LB. INSTALLATIONS
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NIBCO

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THE NIBCO FORMULA for wrot copper fittings is the result of continuous research and the experience gained from decades of manufacturing

Wrot fittings
that are *just right!*

Not too thick, not too thin . . . **NIBCO** wrot copper fittings heat quickly for fast assembly. And, they exceed strength requirements of recommended standards* by more than *six times!* They exceed the required copper content by more than 15%, as well.

Whether you specify copper systems or install them, you'll appreciate the satisfaction of using wrot copper fittings you know are *just right.* Fittings by **NIBCO** are available from leading wholesalers throughout the nation.

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Elkhart, Indiana

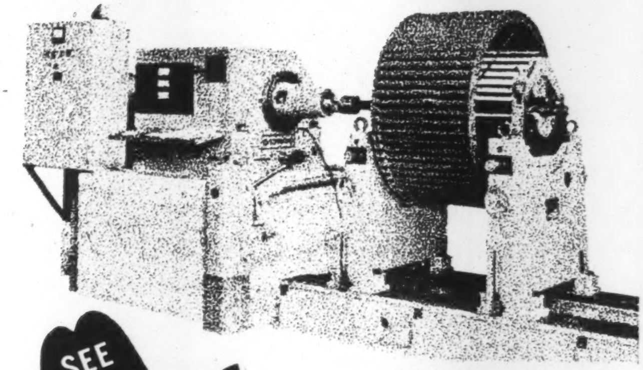
NIBCO

*American Standard
ASA B16.22—1951

UTILITY

UTILITY FAN CORPORATION

WHY UTILITY MOVES AIR BETTER



A Schenck Electro-Dynamic Balancer will be featured in our Dallas display. See for yourself how UTILITY quality is engineered in!

ONE BIG REASON: All blower wheels are precision balanced on special equipment to insure quiet, long-lasting and trouble-free performance. The world's finest dynamic balancer, adapted to UTILITY specifications, is capable of determining center-of-gravity displacement as small as 25-millionths of an inch! And UTILITY uses it all day every day.

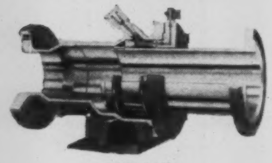
There are many more reasons for UTILITY quality. Let us tell you all about them soon.

UTILITY FAN CORPORATION
Division of Utility Appliance Corp.
911 East 59th Street
Los Angeles 1, California

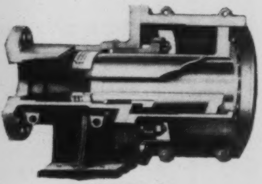
just lost a hatful of trouble...

ONLY ADSCO HAS ALL 3 TYPES OF EXPANSION JOINTS

CORRUFLEX PACKLESS



RAM-PAK



SLIP TYPE

". . . to the Adsco man. He was here a minute ago . . . saw our piping problems in Area F and took them all with him. He'll bring 'em back solved next week and then I'll give him the order for the expansion joints."

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ADSCO DIVISION
World's Oldest and Largest Manufacturer
of Packed and Packless Expansion Joints
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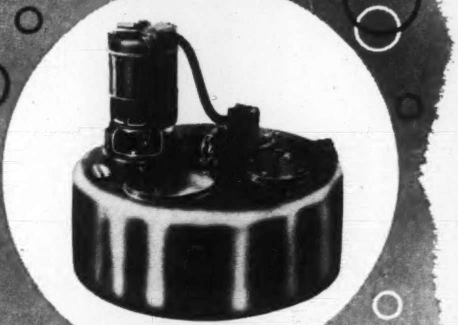
- *consumer durable*

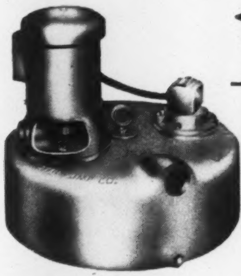
weil TVC



NEW
26 GALLON RECEIVER
for capacities to
15,000 Sq. Ft. E.D.R.

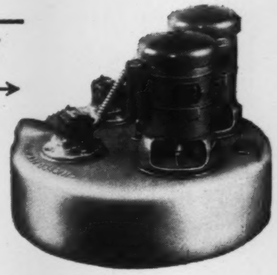
LOW RETURN CONDENSATE PUMP

- **SPACE SAVING** heavy cast iron receiver. No anchor bolts required as receiver weight holds it in place.
- **DUPLEX UNITS** are sized so that each pump is capacity rated for specified conditions. One pump may be removed leaving the other in operation.
- **ALL BRONZE PUMP CONSTRUCTION** insures against the pump sticking. The shaft is stainless steel.



21" O.D. Receiver for single units

25½" O.D. Receiver for single or duplex units



LOW SPEED — 1750 RPM for long life

Unit Number	Max. Sq. Ft. Direct Radiation	Disch. Press. In Lbs. At Pump	GPM Radiation Will Condense	Capacity of Pump in GPM	Motor H.P.	Return Inlet in Inches	Pump Discharge in Inches	Diameter and Capacity of Receiver	Height of Return to Centerline
TVC-19	750	20	.38	1.5	¼	2	1	21" -10 Gal.	6⅞"
TVC-23	1000	20	.5	1.5	¼	2	1	21" -10 Gal.	6⅞"
TVC-29	2000	20	1.0	3.0	¼	2	1	21" -10 Gal.	6⅞"
TVC-35	4000	20	2.0	6.0	¼	2	1	21" -10 Gal.	6⅞"
TVC-41	6000	20	3.0	9.0	⅓	2	1	21" -10 Gal.	6⅞"
TVC-47	8000	20	4.0	12.0	½	2	1	25½"-15 Gal.	7³⁄₁₆"
TVC-52	10000	20	5.0	15.0	¾	2	1	25½"-15 Gal.	7³⁄₁₆"
TVC-54	15000	10	7.5	22.5	½	3	1¼	25½"-26 Gal.	10½"
TVC-55	15000	20	7.5	22.5	¾	3	1¼	25½"-26 Gal.	10½"
TVC-56	15000	30	7.5	22.5	1	3	1¼	25½"-26 Gal.	10½"
TVC-57	15000	40	7.5	22.5	1½	3	1¼	25½"-26 Gal.	10½"

With these weil TVC Pumps, radiation may be placed as low in the building as desired. Underground gravity return lines are eliminated and overhead discharge lines used. The built-in durability, ease of installation, low cost and efficient operation of the TVC Pump warrants its selection for new installations or replacements.

Now available in Jobbers' Stocks

weil PUMP COMPANY

Send for Bulletin TVC-300

See Catalog in Sweet's and Domestic Eng. Cat. Dir.

1514 No. Fremont Street — Chicago, Illinois

If you're a heads-up, both-feet-on-the-ground kind of man who knows his way around in business – you're sold on your businesspaper. You know from profitable experience, there's nothing else in print so packed with facts, news, and good ideas that help you stay on top in business as the advertising and editorial pages of . . . your businesspaper.

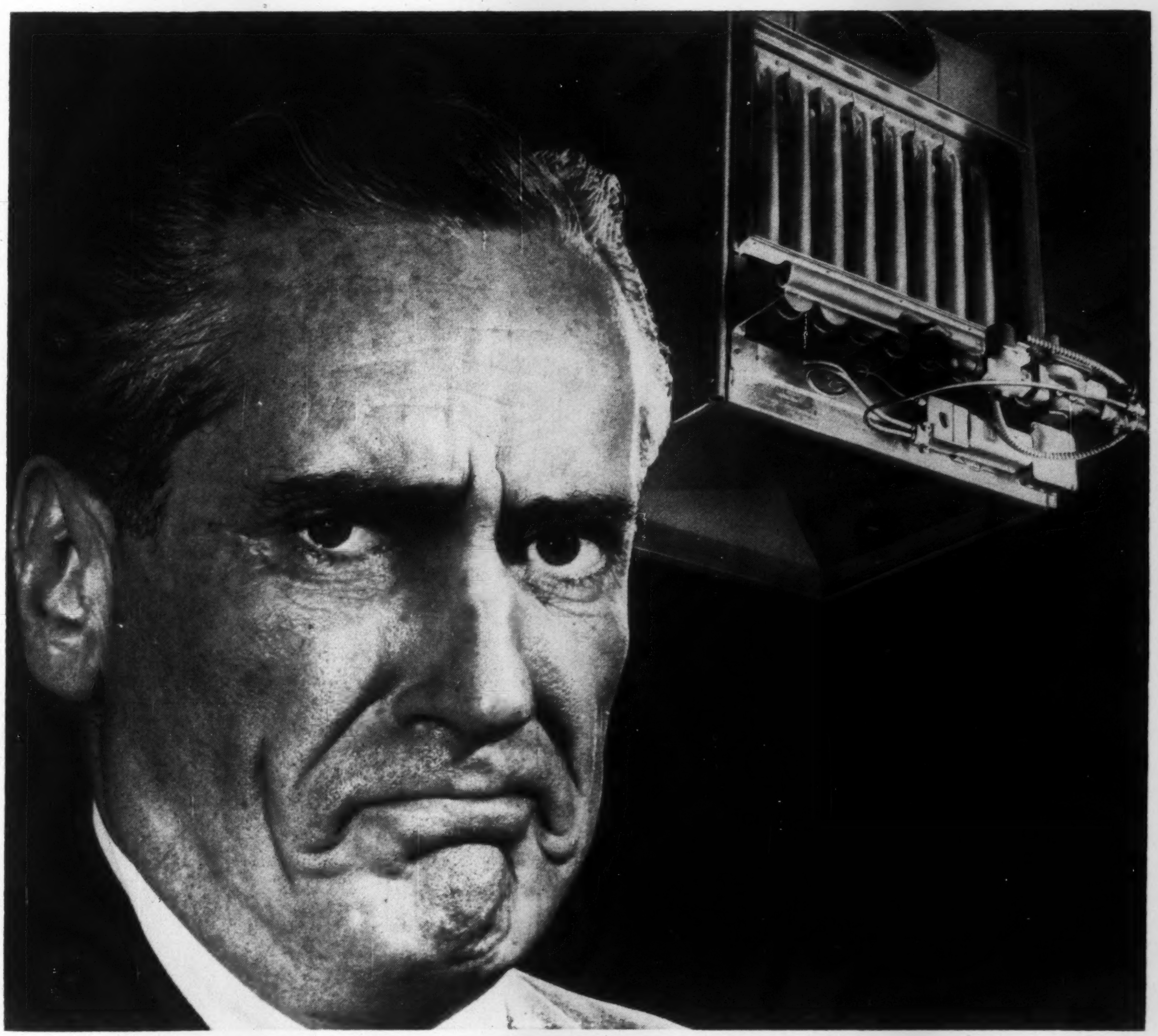
PHOTO ON LOCATION BY EHRENBERG

Where there's business action, there's a businesspaper . . . where there's heating, piping and air conditioning business, there's Heating, Piping and Air Conditioning

BUSINESS PAPER LEADERSHIP ABP

AUDITED PAID CIRCULATION ABC

of a series of advertisements prepared by the ASSOCIATED BUSINESS PUBLICATIONS



TOUGH BUYERS

DEMAND REZNOR STAINLESS STEEL DUCT FURNACES

BECAUSE THE HEAT EXCHANGER AND BURNERS CANNOT CORRODE!

The plumbing, heating or air conditioning contractor has to be a tough buyer. He has to look ahead and consider possible trouble makers like corrosion in air conditioning, make-up or ventilation air systems. That's why so many contractors demand Reznor *stainless steel* duct furnaces: they *can't* corrode!

LOWER FUEL COSTS, TOO —The tough buyer wants to make sure his customers get even heat and lower fuel costs. That's why he appreciates Reznor "extras," like the gas modulating valve. As discharge temperatures rise, the valve cuts gas input to 20% of rated capacity, then shuts off the supply completely.

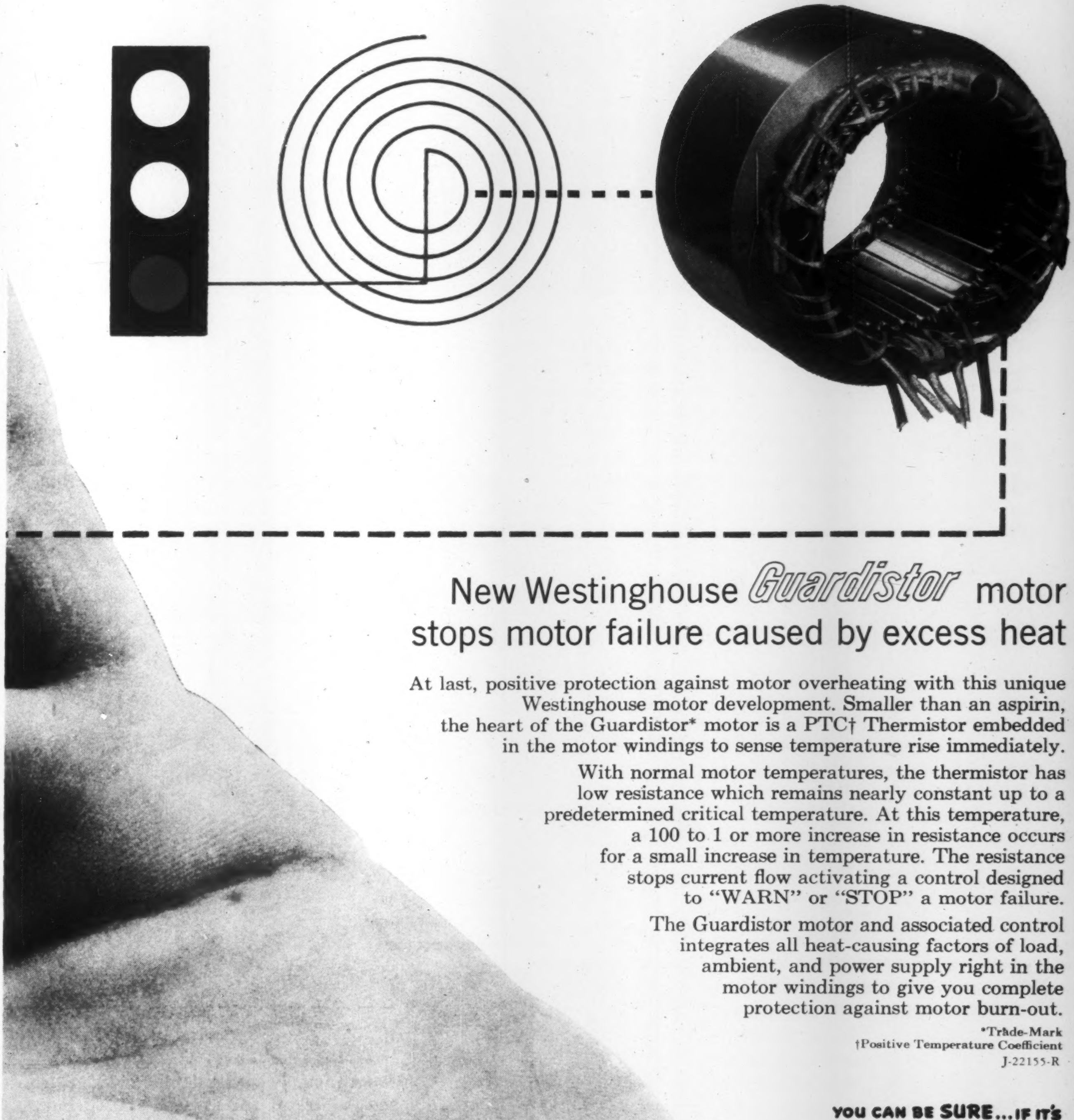
CHECK THE "TOUGH BUYERS' LINE" You can order and install Reznor duct furnaces in capacities up to 300,000 Btu. Use them in multiples for greater heat requirements. Buy matching Reznor blowers.

For the full story, phone your local Reznor distributor, or write to Reznor Manufacturing Company, Dept. 51B, Mercer, Pennsylvania.

THE HEATING WORLD IS FULL OF TOUGH BUYERS; THAT'S WHY REZNOR IS THE WORLD'S LARGEST SELLING DIRECT-FIRED HEATER!

REZNOR HEATERS

"THE TOUGH BUYERS' LINE"



New Westinghouse Guardistor motor stops motor failure caused by excess heat

At last, positive protection against motor overheating with this unique Westinghouse motor development. Smaller than an aspirin, the heart of the Guardistor* motor is a PTC† Thermistor embedded in the motor windings to sense temperature rise immediately.

With normal motor temperatures, the thermistor has low resistance which remains nearly constant up to a predetermined critical temperature. At this temperature, a 100 to 1 or more increase in resistance occurs for a small increase in temperature. The resistance stops current flow activating a control designed to "WARN" or "STOP" a motor failure.

The Guardistor motor and associated control integrates all heat-causing factors of load, ambient, and power supply right in the motor windings to give you complete protection against motor burn-out.

*Trade-Mark
†Positive Temperature Coefficient
J-22155-R

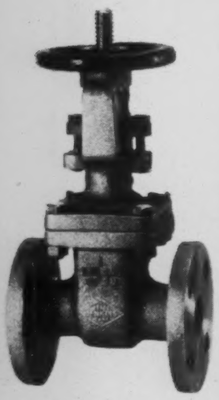
YOU CAN BE SURE...IF IT'S
Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

For 99 out of 100 . . .

Selection of Stainless Steel Valves can be as simple as selection of Bronze and Iron valves

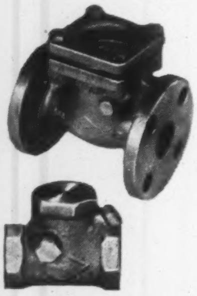
HOW to keep it simple? Don't let the wide selection of stainless steel alloys "throw you"!



Most of the alloy specs were developed to meet certain highly specialized and rather uncommon needs. Only 1 out of 100 valve users can make practical use of many of the alloys. *Actually, just two or three of the different available alloys will give a big majority of valve users all they want and need.*

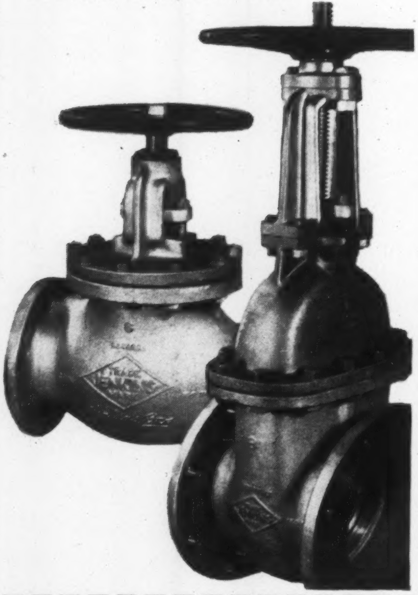
You can judge DESIGN differences between the various "makes" exactly as you do it with Bronze and Iron valves. Look them over and compare. Basically, of course, a Stainless Steel valve is designed and constructed very much like other valves.

What is left to worry about in addition to Material and Design? The same factors you consider in buying ANY valves for long, dependable performance: Are the valves made merely good enough, or to a standard that demands an extra-measure of quality? How good are the castings? How precise and perfect is the machining? How rigid is the inspection and testing during manufacture? These are the factors which specs can't cover. Some of them you can't see when you look at the valve. But you KNOW how to make sure they measure-up to peak standards. You know that the name JENKINS VALVES and the famous Jenkins DIAMOND trademark have been the highest assurance of quality for nearly a century.



JENKINS
STAINLESS
STEEL

Specify *"Jenkins"* as well as the metal alloy to assure fullest satisfaction. Your Jenkins Distributor has patterns and alloys to satisfy most industrial needs. Of course, they meet valve industry specifications and the high standards established by leading users of stainless steel valves. Jenkins Bros., 100 Park Ave., New York



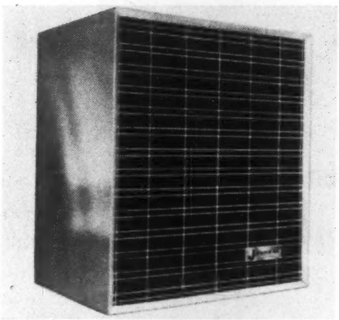
Jenkins Bros.
100 Park Ave., New York 17.
Send Jenkins Stainless Steel Valve Catalog to —
Name & Title..
Company..
Address..

JENKINS VALVES

JENKINS
SINCE 1864
Jenkins Bros

EQUIPMENT DEVELOPMENTS...

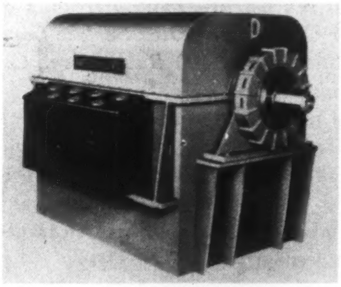
For reviews of Recent Trade Literature see page 358



Unit Heaters . . .

. . . designed to blend in with surrounding interior areas—*Janitrol Heating & Air Conditioning Div. Surface Combustion Corp., 400 Dublin Ave., Columbus 16, O.*

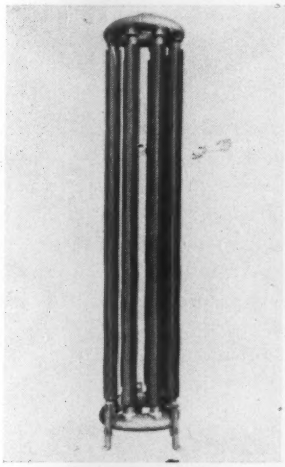
Heaters feature cabinets of functional design and side panels free of conventional grilles; all units have limit control which interrupts automatic control circuit and shuts off fuel if temperature becomes excessive; available in 11 models with 30,000 to 250,000 Btu per hr input range; descriptive bulletin "JS-151P" available on request.



Pump Drive . . .

. . . available for either 2600 or 1800 rpm operating input speed—*American-Standard Industrial Div., Detroit 32, Mich.*

Designed for use where boiler feed pump is driven directly from main turbine generator shaft; units available for use with any size boiler pump.



Finned Tank Heater . . .

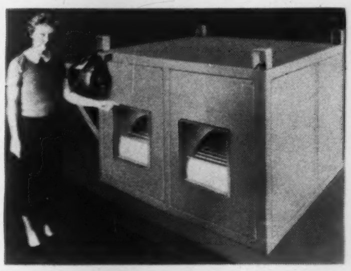
. . . providing steam redistribution, drainage of condensate, high corrosion allowances—*Brown Fintube Co., Elyria, O.*

Available in pressure rating of 600 psi at 650 F; has 295 sq ft of heating surface and displacement of approximately 2 cu ft.

Heat Exchanger . . .

. . . designed for processing corrosive liquids—*Corning Glass Works, Corning, N.Y.*

Available in 60 sq ft capacity containing bundles of 31 glass tubes ¾ in. in diam; exchangers can take operating temperatures up to 200 F on shell side and 375 F on tube side; working pressures can be as high as 20 psi; exchangers can be mounted horizontally or vertically in any combination series or parallel flow; wide range of fittings can be used.



Air Handling Units . . .

. . . for central air conditioning applications—*Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.*

Offered in 16 models in capacity range from 880 to 47,500 cfm; velocities from 400 to 700 fpm are obtainable under static pressures up to 2 in. water gage; can be used with direct expansion coils in capacities from 3 to 120 nominal tons under standard conditions.

Pyrometer . . .

. . . to measure temperatures between −40 F and 200 F—*Illinois Testing Laboratories, Inc.,* 420 *N. LaSalle St., Chicago* 10.

Pyrometer operates by means of two scales or arcs in order to provide 1 F per scale division and readability to at least nearest ½ F; descriptive bulletin "2146-C" available on request.

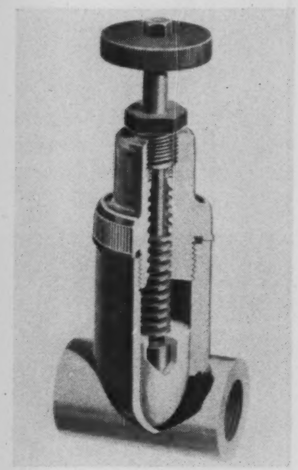
Damper Regulator . . .

. . . designed for ducts carrying high pressures or low vacuums—*Young Regulator Co.,* 20910 *Miles Ave., Cleveland* 28, *O.*

Can be installed in round ducts 4 to 8 in. in diam; is recommended by manufacturer where pressure is over 6 psi; unit uses neoprene gasket at base; by using lead washers, unit withstands pressures in excess of 50 psi without leakage, according to manufacturer.

EQUIPMENT DEVELOPMENTS

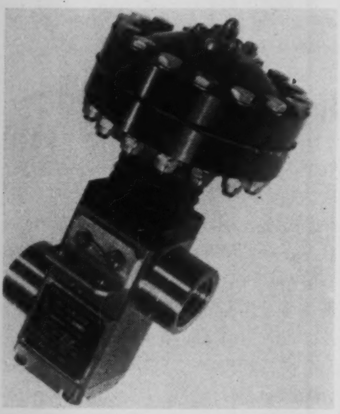
Continued



Gate Valve . . .

. . . for use in process industries—*Vanton Pump & Equipment Corp.*, 201 *Sweetland Ave., Hillside, N.J.*

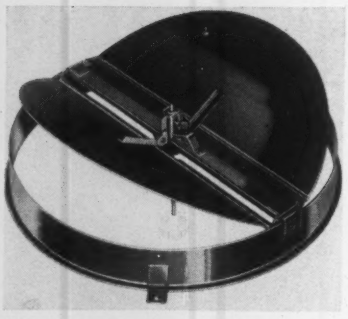
Available in ½ through 2 in. socket weld, flanged or screwed ends; operates to 257 F; features straight through, minimum pressure drop flow with close throttling control.



Gas Regulator . . .

. . . to handle inlet gas temperatures to 450 F—*Western Sky Industries*, 21301 *Cloud Way, Hayward, Calif.*

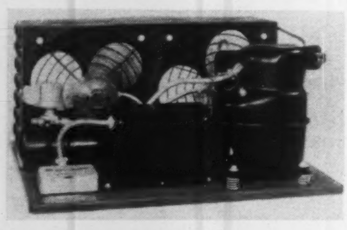
Regulator is adjustable from 200 to 2500 psig and maintains accuracy to ± 5 percent of dome load; dome-loaded design uses gas to reduce pressure variation; corrosion resistant steel forms regulator body; seat and poppet are erosion resistant; body is sealed with metal seals and isolated from aluminum alloy dome by heat dissipating finned section.



Diffuser Damper . . .

. . . for evaporative cooling systems—*Air Control Products, Inc., Coopersville, Mich.*

Features adjustment set with screwdriver after installation to stop damper at predetermined opening; descriptive bulletin "262-AC" available on request.



Condensing Units . . .

. . . designed for high back pressure applications — *Bendix-Westinghouse Automotive Air Brake Co.*, 950 *E. Virginia St., Evansville* 11, *Ind.*

New model is 2 hp using refrigerant 12; features dual voltage liquid line solenoid valve as integral part of unit; operates on 230 v, 60 cycle, single-phase.

Proportioning Pump . . .

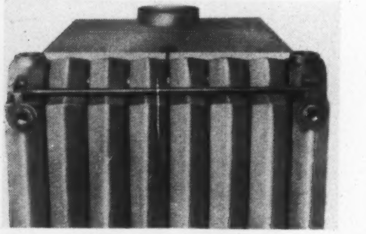
. . . for accurate proportioning of concentrated corrosive chemicals—*B-I-F Industries, Inc.*, 345 *Harris Ave., Providence* 1, *R.I.*

Positive displacement pump may be wall- mounted, or may be installed on floor, shelf; range is over 4 to 1 with capacity up to 0.7 gph with discharge pressures up to 100 psig.

Power Drill . . .

. . . with off-set design of chuck head to permit finger clearance on flush drilling—*Black & Decker Mfg. Co.*, 628 *Pennsylvania Ave., Towson, Md.*

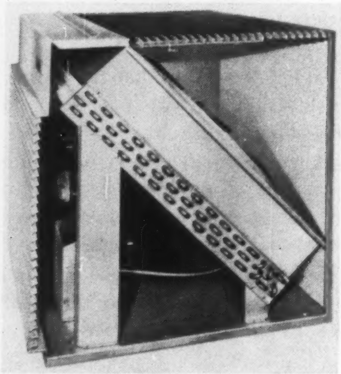
Drill is ¼ in. model equipped with full-length paddle switch to enable operator to maintain positive start and stop control.



Boiler Pads . . .

. . . permitting boiler section expansion without cracking—*Peerless Heater Co., Boyertown, Pa.*

Pads are precision ground in order to mate properly and evenly space each section, eliminating iron-to-iron contact.



Condensing Unit . . .

. . . in capacities from 22,000 to 110,200 Btu per hr—*Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.*, 400 *Dublin Ave., Columbus 16, O.*

Units feature use of condensing coils of greater area, positioned diagonally in cabinet; cabinet design permits side-by-side installation of any number of units with zero clearance between.

Roof Ventilator . . .

. . . designed to meet modern architectural demands—*Hirschman-Pohle Co., Inc., Dept. HPC-*14, 12 *Lent St., LeRoy, N.Y.*

Offered in wide range of sizes in weatherproof housing; bulletin "59-SP" contains complete specifications, dimensions.

B&W has taken *the* step...

6" SCH. 40 B&W WPB C11

a NEW PLANT at Beaver Falls for the manufacture of a

COMPLETE LINE OF WELDING FITTINGS AND FLANGES

Beaver Falls, Pennsylvania is the site for B&W's new Welding Fittings plant. When in operation it will be one of the most efficient sources of supply in the industry . . . one that has been designed with product quality as well as customer service in mind. Not only will it have facilities for the manufacture of a complete line of carbon, alloy and stainless steel fittings and flanges, but its location makes possible integration with B&W's other manufacturing operations . . . their steel mills and their tube mills.

This means that

(a) you can get a complete line of welding fittings and flanges

(b) you can get a complete process piping package — welding fittings, flanges *and* tubular products from one source

(c) you can more effectively control both buying and delivery from one manufacturer . . . The Babcock & Wilcox Company

An announcement of the transfer of welding fittings operations from Milwaukee to Beaver Falls will be made in the near future.

For further details ask for bulletin FDM-2016 or call on any of the local B&W District Sales Offices. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

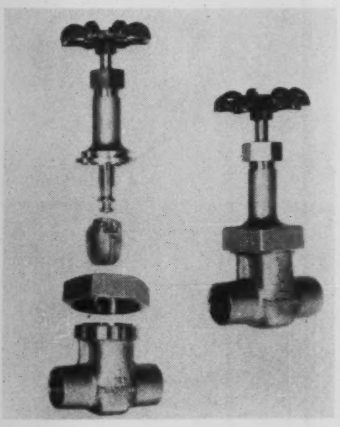
B&W

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

TA-9026-G1

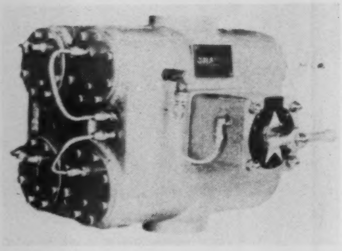
Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals



Gate Valve . . .

. . . of solder joint, rising stem, bronze type—*Walworth Co.,* 750 *Third Ave., New York* 17.

Available in 3/8 through 3 in. sizes; has pressure rating of 125 psi.



Control Valve . . .

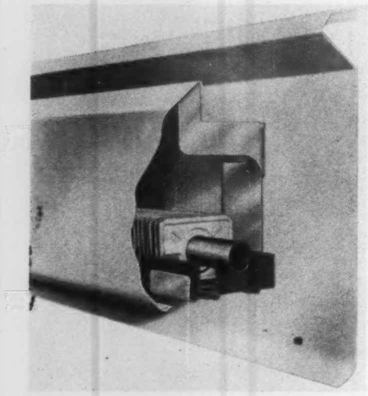
. . . for directing flow of liquids in zeolite softeners, ion exchange units, filters—*Graver Water Conditioning Co.,* 216 *W.* 14*th St., New York* 11.

Valve features pilot control, positive hydraulic pressure actuation; all internal moving parts can be readily removed for inspection and service without dismantling connecting piping or removing valve from unit on which it is being used.

Torque Control . . .

. . . to control amount of expansion in tubes 1/4 through 4 in. outside diam—*Gustav Wiedeke Co.,* 1833 *Richard St., Dayton, O.*

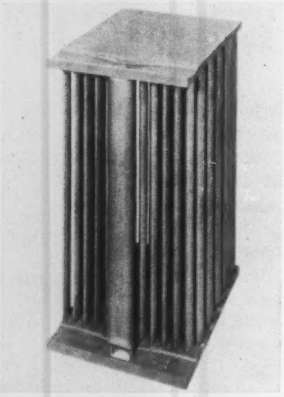
Dual range ammeter can be set in 0 to 10 amp range for small motors and 0 to 20 amp range for larger motors; time delay circuits embodied in unit enables operator to adjust cycle of control instrument to match size of motor; descriptive bulletin "AC-7A" available on request.



Baseboard Radiation . . .

. . . for full-perimeter hydronic heating—*Radiant-Ray Radiation, Inc.,* 464 *Hartford Ave., Newington, Conn.*

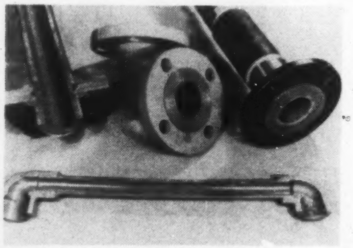
Unit is 8 in. high and comes in 3/4, 5, 6, 8 ft lengths with optional damper and control knob.



Entrainment Separators . .

. . . for separation of entrained liquids from corrosive gas streams—*National Carbon Co., Div. of Union Carbide Corp.,* 535 *Fifth Ave., New York* 17.

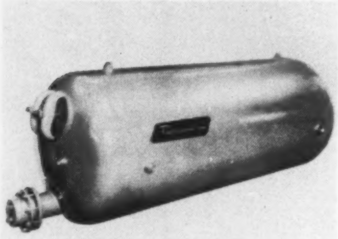
Separator modules made of impervious graphite measuring 1×2 ft; number of modules required for given application can be determined by dividing total gas flow by capacity of one module.



Plastic Fittings . . .

. . . for handling solvents and hot corrosive liquids in process piping—*Tube Turns Plastics, Inc.,* 2929 *Magazine St., Louisville* 11, *Ky.*

Fittings available include elbows, tees, couplings, caps, plugs, flanges, unions, nipples, reducer couplings, reducer bushings in 1/2 to 2 in. sizes, threaded and socket type.



Glass Lined Tanks . . .

. . . protected by magnesium anode—*Raypak Co.,* 2116 *Chico Ave., El Monte, Calif.*

Tanks feature glass lining because of 11 × 15 in. access manhole permitting lining to be done after ends are welded to tank.

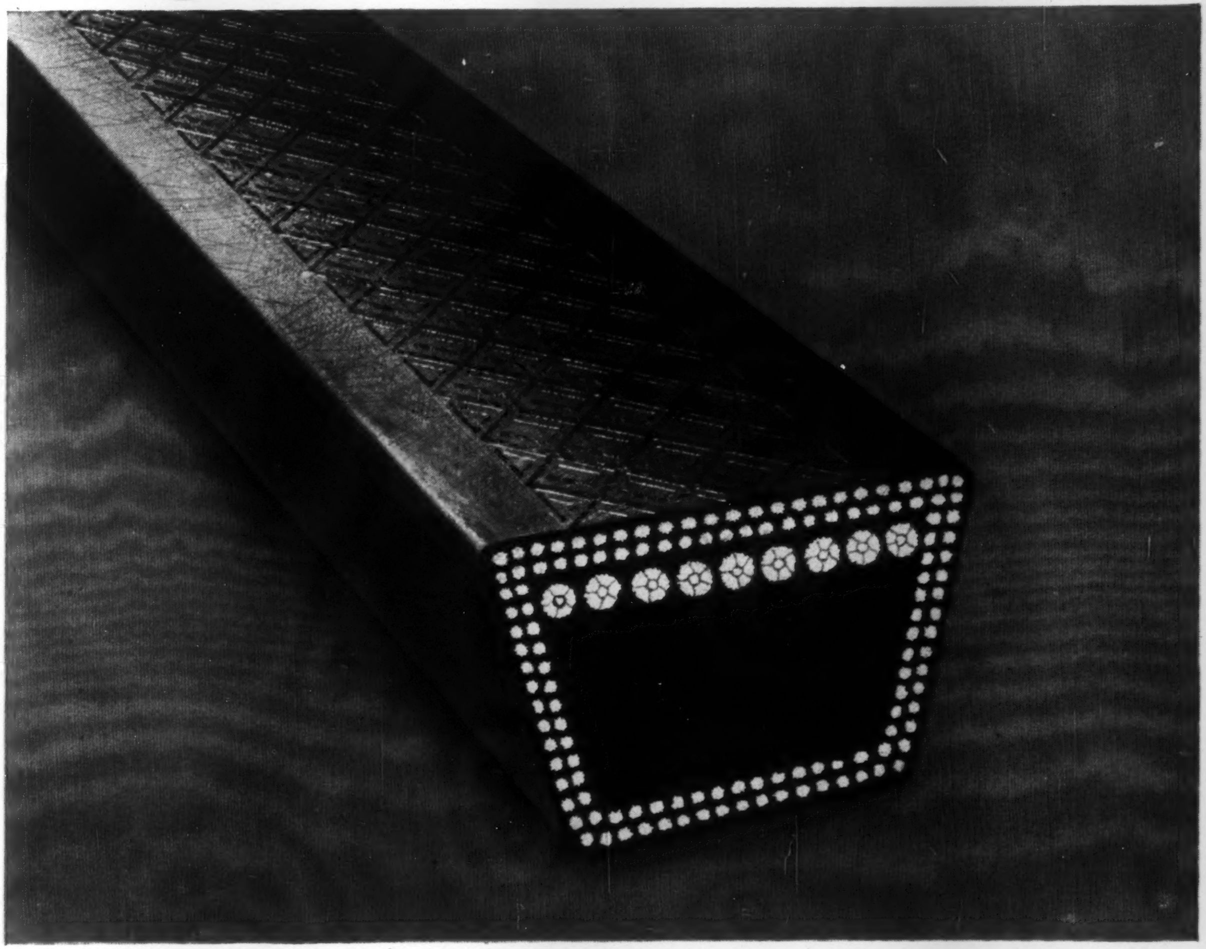
Ball Valve . . .

. . . in temperature range from −300 to 400 F—*Cooper Alloy Corp., Bloy St., & Ramsey Ave., Hillside* 5, *N.J.*

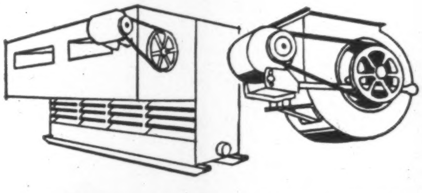
Valves have been tested out to 1000 psi in sizes 1/4 to 3/4 in. and to 600 psi in sizes 1 through 2 in. in stainless steel; full port opening permits straight through flow; union ends provide automatic self alignment with piping, adjusting shims prolong life seal; valve can be on full flow in any position around axis without special adjustment of flanges; available in stainless steel and carbon steel.

AUTO AIRCON STEEL CABLE V-BELTS
from the Power Unlimited complete belt line

Patented curing method keeps all the steel pulling members in the same plane. They remain straight, are never wavy.



Quiet...smooth... vibration at the vanishing point



For silent and efficient operation of fans, pumps, compressors, blowers —for best power transmission in air-conditioning and refrigeration units —specify U. S. Auto AirCon Steel Cable V-Belts. These belts have everything required in a belt for air-conditioning use. They are in a class by themselves. Forget your negative experiences with other V-belts. U. S. Auto AirCon V-Belts have pulling cords of steel. A new, patented curing method and electronic tensioning of the steel cords *free this belt from vibration.* Power is transmitted smoothly, quietly, efficiently. It has been proven in rugged, automotive air-conditioning service. This belt has outlasted other belts up to 2½ times longer.

Our transmission engineers stand ready to consult with you on any and all transmission belt problems. Drop us a line at the address below.

• • •

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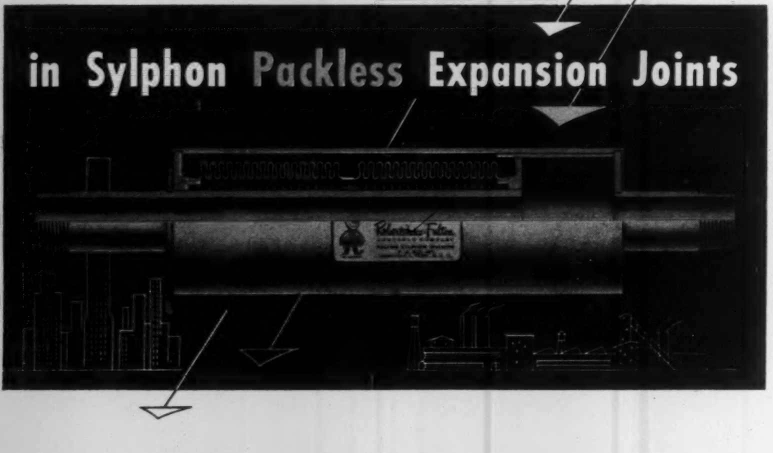
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.   In Canada: Dominion Rubber Company, Ltd.



NOW...PIPE SIZES UP TO 6"

in Sylphon Packless Expansion Joints

- Externally Shielded
- Internally Guided
- Full Two-Inch Traverse
- 150 Lbs. Working Pressure

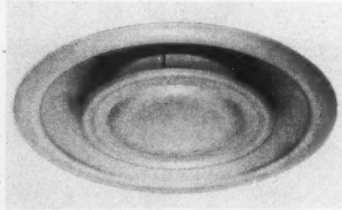
Broader pipeline service for schools, institutions, office buildings, plants! Our ruggedly built 1291 Packless Expansion Joint is now available from ¾" to 6" pipe sizes for horizontal or vertical pipe lines—either water or steam.

Built around the famous Sylphon® Bellows of multi-ply stainless steel, this hard-working, trouble-saving joint is externally shielded and internally guided—yet comes to you reasonably priced and completely assembled, ready for immediate installation and lifetime service.

Choose from a complete range of Sylphon Packless Expansion Joints, with bellows of monel, copper or stainless steel. No packing problems, no costly repairs . . . surveys show less than 2% replacement after 25 years' service!

Get the Facts on Packless . . . in Catalog F-AH

Robertshaw® MR. CONTROLS
ROBERTSHAW-FULTON CONTROLS COMPANY
FULTON SYLPHON DIVISION • KNOXVILLE I, TENNESSEE



Air Diffuser . . .

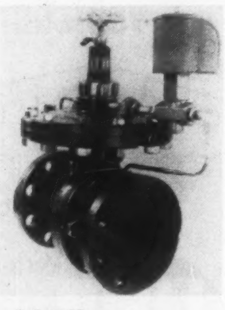
. . .for application when no adjustment of air discharge is necessary—*Connor Engineering Corp., Danbury, Conn.*

Features include built-in damper, plastic rim gasket for positive seal, air discharge in single, circumferential pattern; bulletin "K-44" gives construction and performance features, sizes and capacities, mounting direction and illustrations.

Plastic Nozzle . . .

. . .for use wherever non-metallic, corrosion proof nozzle is required—*Bete Fog Nozzle, Inc., 309 Wells St., Greenfield, Mass.*

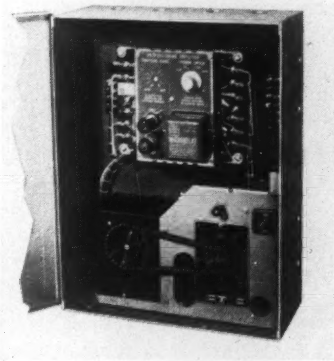
Available in 28 models with wide or narrow angle, full or hollow cone, and seven different flow rates from 2 to 70 gpm.



Solenoid Pilots . . .

. . .for application where remote shut-off, start-up, automatic safety shut-off, and combination pressure and temperature control are needed —*OPW-Jordan,* 6013 *Wiehe Rd., Cincinnati* 13, *O.*

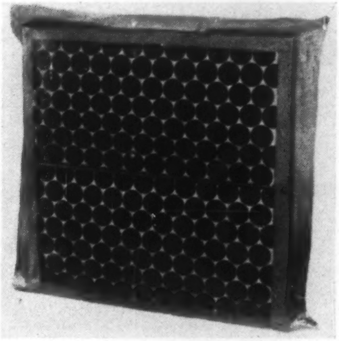
Available in ductile iron ½ to 3 in., bronze ½ to 2 in., cast iron 2½ to 3 in.; suitable for temperatures of 500 F and pressures of 250 psi; complete description in bulletins "SRBc 62-59" and "JNP-1" available on request.



Electric Heat Control . . .

. . . to control power demand during warm-up period on electric unit ventilator applications—*Barber-Colman Co., Rockford, Ill.*

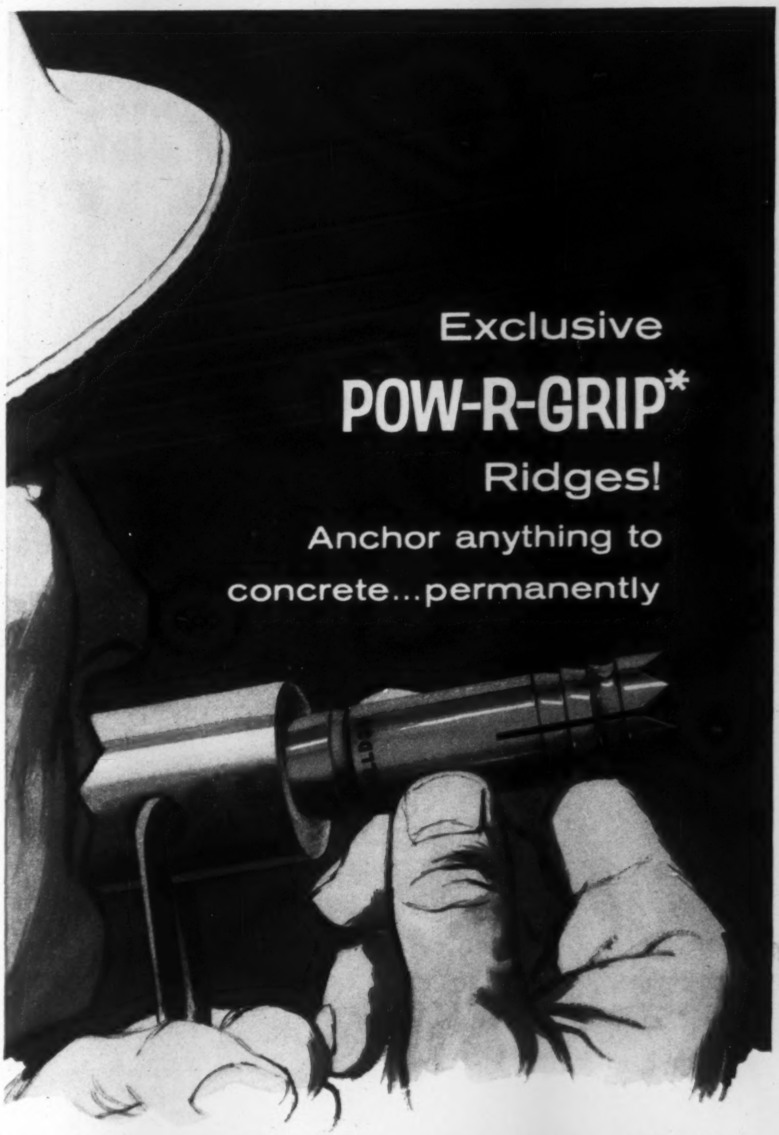
Available with 15 and 30 min cycle periods; data sheet "F-9383" contains applications, operation, construction characteristics.



Odor Filter . . .

. . . for control of odor and other unwanted gases—*American Air Filter Co., Inc., Dept PD,* 215 *Central Ave., Louisville* 8, *Ky.*

Available in four standard sizes to



BULLDOG
Gold Digger.®

*POW-R-GRIP ridges around the shank of the BULLDOG "Gold Digger" drill/anchor permit *faster, easier drilling* into hardest concrete, brick or stone. Once the drill/anchor is set, these powerful ridges, plus the proven expansion principle of "Gold Digger" drill/anchors, assure greatest holding-power under all job and climatic conditions. Only POW-R-GRIP ridges assure "the grip that never fails".

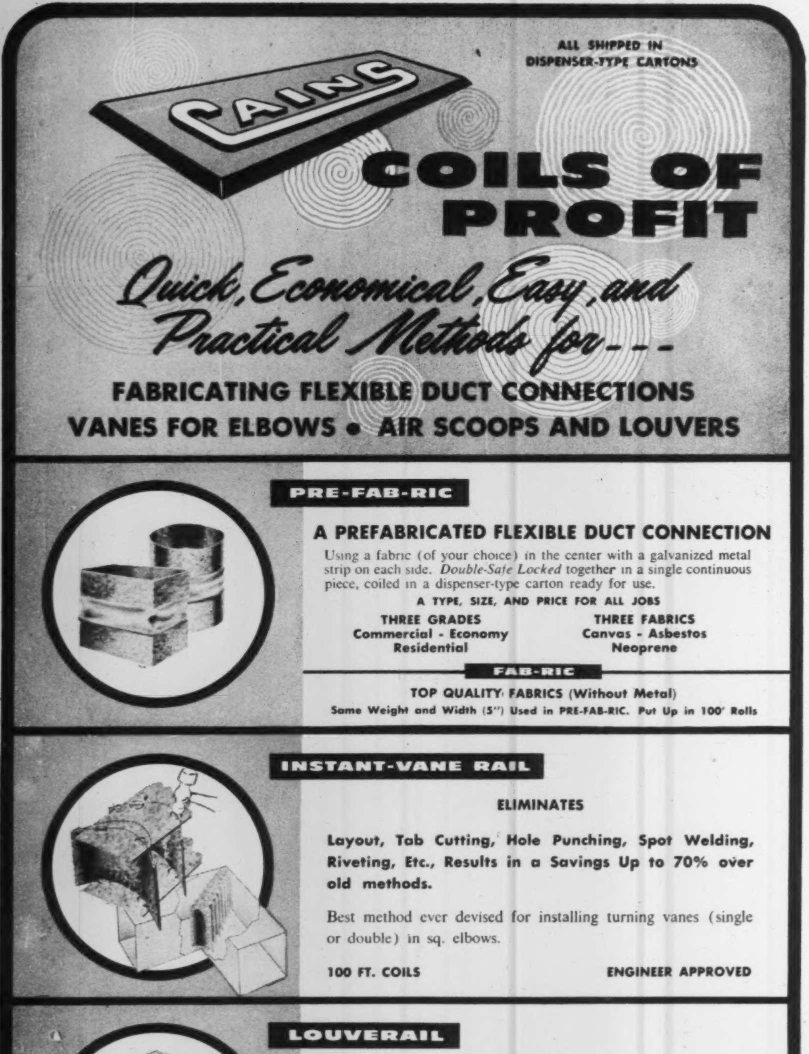
Send for full details today!

BULLDOG DIVISION
(Formerly Polis Manufacturing Co.)
GREGORY INDUSTRIES, INC.
102-10 Toledo Avenue • Lorain, Ohio

Please send *free* specification and application booklet.

Name ____
Firm ____
Address ____
City ____ Zone ____
State ____

BULLDOG DIVISION, GREGORY INDUSTRIES, INC., 102-10 Toledo Avenue • Lorain, Ohio


ALL SHIPPED IN DISPENSER-TYPE CARTONS

CAINS

COILS OF PROFIT

Quick, Economical, Easy, and Practical Methods for---

FABRICATING FLEXIBLE DUCT CONNECTIONS
VANES FOR ELBOWS • AIR SCOOPS AND LOUVERS

PRE-FAB-RIC

A PREFABRICATED FLEXIBLE DUCT CONNECTION

Using a fabric (of your choice) in the center with a galvanized metal strip on each side. *Double-Safe Locked* together in a single continuous piece, coiled in a dispenser-type carton ready for use.

A TYPE, SIZE, AND PRICE FOR ALL JOBS

THREE GRADES
Commercial - Economy
Residential

THREE FABRICS
Canvas - Asbestos
Neoprene

FAB-RIC

TOP QUALITY FABRICS (Without Metal)
Same Weight and Width (5") Used in PRE-FAB-RIC. Put Up in 100' Rolls

INSTANT-VANE RAIL

ELIMINATES

Layout, Tab Cutting, Hole Punching, Spot Welding, Riveting, Etc., Results in a Savings Up to 70% over old methods.

Best method ever devised for installing turning vanes (single or double) in sq. elbows.

100 FT. COILS

ENGINEER APPROVED

LOUVERAIL

ELIMINATES

Layout, Tab Cutting, Hole Punching, Riveting, Spot Welding, Etc.

AN ECONOMICAL AND PRACTICAL METHOD FOR FABRICATING LOUVERS — REMOVABLE, HINGED, OR STATIONARY. LOUVERAIL is 24 ga. galvanized 4½" wide in (2—50' lengths) 1 right and 1 left coiled together.

Split (½) Rail for Louver Thicknesses From 1¼" to 1¾".
Use Full Size Rail for Louver Thicknesses From 3¼" to 4".

SCOOP-RAIL

ELIMINATES—
- Radius ell, transition, and splitter damper at branch duct take-offs.
- Volume damper on grille.
- Job delay in ordering.

SCOOP-RAIL for fabricating air scoops for branch ducts and grille collars. Insuring uniform air distribution. Complete control of air volume in branch duct or at grille face. Simplifies balancing of the system.

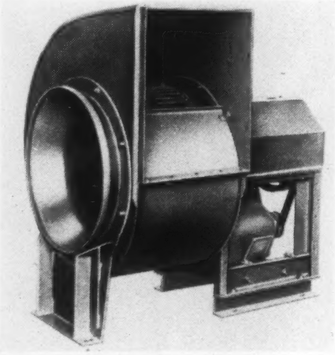
1. Not necessary to remove grille to adjust volume. Use bent rod or wire thru grille to adjust unit in and out of main duct.
2. S. M. screws at top and bottom.

USED AT BRANCH DUCT

1. ⅜" standard quadrant where accessible.
2. Speed nut tabs for ⅜" square rod are riveted, spotwelded or s. m. screwed to ends of SCOOP-RAIL.
3. Where desired clg. control may be used.

CAIN MANUFACTURING, INC. Union Made
Phone FA 2-0354
1111 North 5th Avenue
Birmingham, Alabama

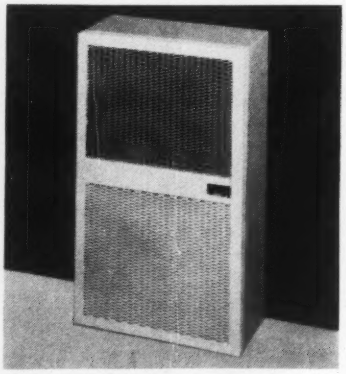
fit 2 in. frames; disposable activated carbon filters; bulletin "220" describes filters, contains engineering data, all capacities and dimensions.



Centrifugal Fans . . .

. . . for supply or exhaust installations —*Clarage Fan Co., Porter St., Kalamazoo* 16, *Mich.*

Designed for volumes to 25,000 cfm, static pressures through 2¼ in. water gage, and temperatures to 300 F; may be used indoors or outdoors for ventilating, spot cooling, supplying process air, exhausting fumes; catalog "517" available on request.



Fan-Coil Unit . . .

. . . to provide all-season air conditioning with hydronic systems for commercial applications—*National-U.S. Radiator Corp.*, 944 *Ash St., Johnstown, Pa.*

Units rated at nominal capacities from 2500 to 5500 Btu per hr with 15 cfm air flow rate; fan motor is taped-winding type, rated at 1/70 hp, 950 rpm and does not require variable speed rheostat.

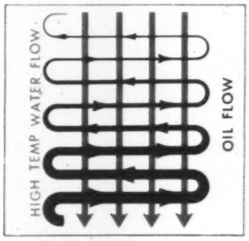
HOW TO USE high temperature water directly in a no. 6 oil heater—with no danger of system contamination!

The unique Paracoil "Thermo-Film" heater permits *direct use of HTW in the same heater shell with the fuel oil.* The "Thermo-Film" design provides all necessary circuit isolation. This means smaller space requirements, simpler operation and lower installation costs than alternate methods using intermediate exchangers with inter-connecting piping, regulators, level controls, etc.

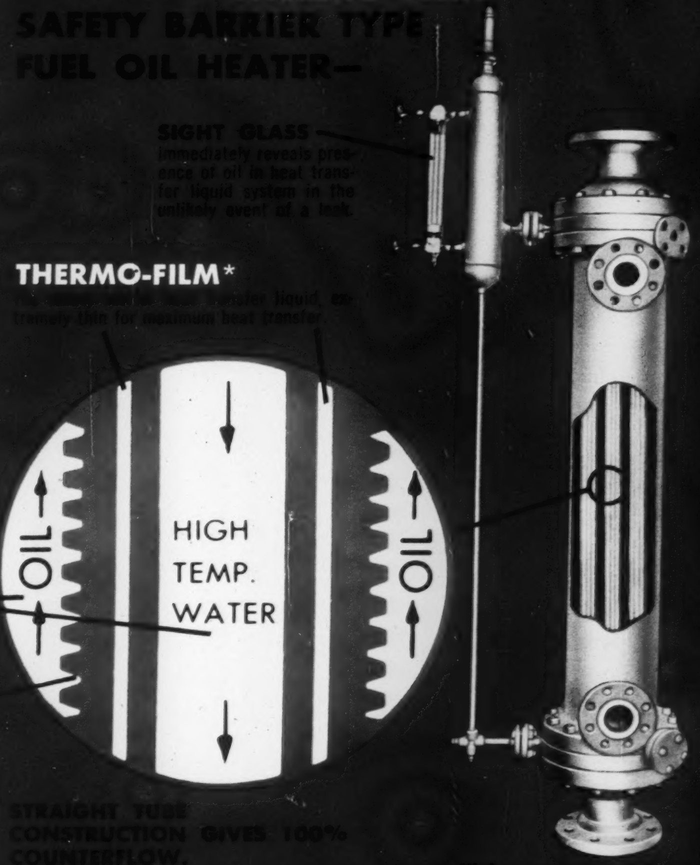
COMPLETE ISOLATION of HTW and fuel oil is accomplished by a coaxial tube assembly, with heat-transfer liquid separating inner and outer tubes. *Boiler contamination in the event of oil tube failure is impossible.*

EXTENDED SURFACE of outer tubes substantially reduces size and weight of heater.

INTERNAL TURBULENCE — with oil baffled back and forth across heating tubes — increases heat transfer rates and reduces bulk of the heater.



PARACOIL "THERMO-FILM" SAFETY BARRIER TYPE FUEL OIL HEATER—



SIGHT GLASS — immediately reveals presence of oil in heat transfer liquid system in the unlikely event of a leak.

THERMO-FILM*

[illegible] heat transfer liquid, extremely thin for maximum heat transfer.

STRAIGHT TUBE CONSTRUCTION GIVES 100% COUNTERFLOW.

Heated oil exits at end where HTW enters at its highest thermal head—another feature assuring maximum heat transfer.

High pressure model—for HTHW installations on discharge side of pump

DAVIS ENGINEERING
A Division of American Metal Products Co.
520 MAIN AVENUE, WALLINGTON, N. J.

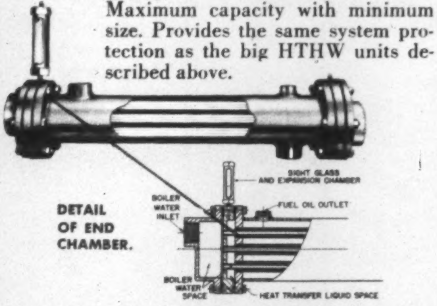
*Reg. U.S. Trade Mark

▼ MAIL THIS CARD for information and specifications

ALSO—LOW PRESSURE MODELS

Compact units using low pressure boiler water, for installation on suction or discharge side of oil pump.

Maximum capacity with minimum size. Provides the same system protection as the big HTHW units described above.



DETAIL OF END CHAMBER.

TURN PAGE FOR ADDITIONAL DESIGNS OF PARACOIL FUEL OIL HEATERS — YOU MAY HAVE BEEN LOOKING FOR ONE OF THEM!

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
First Class Permit No. 459, Passaic, N. J.

DAVIS ENGINEERING
(A Division of American Metal Products Company)
520 MAIN AVENUE.
WALLINGTON, N. J.

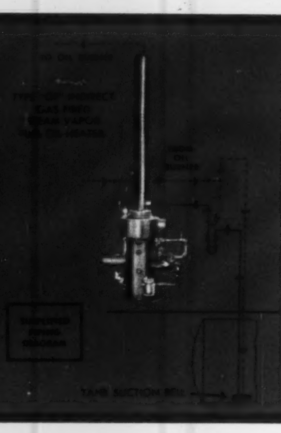
which of these fuel oil heating problems can Paracoil help you solve?

UNDERGROUND STORAGE

Virtually all underground fuel oil storage problems are solved by this new Paracoil Type "VUF" Vertical Tank Suction Heater. It inserts into the tank vertically through a standard manhole, leaving all piping connections accessible outside the tank. Tube bundle can even be removed from a full tank—without breaking oil piping. Model shown is for use with hot fluids under forced circulation. Other designs are available using high pressure steam as the heating medium.

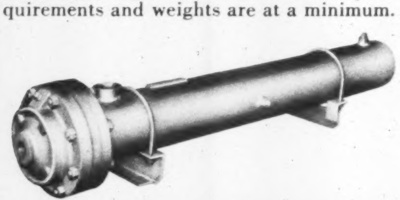
INTERMITTENT PLANT OPERATION

During plant shutdowns (weekends, for example), the Paracoil Type "GF" indirect gas-fired fuel oil heater system maintains proper temperatures in your fuel oil circuit. It uses low cost gas rather than more expensive electricity. The gas, which is kept isolated from the oil tubes, generates a supply of low pressure steam to heat the oil. When the main boiler resumes operation, a steam evaporator takes over the fuel oil heating, and cuts out gas operation.


TO OIL BURNER
TYPE "GF" INDIRECT GAS FIRED STEAM VAPOR FUEL OIL HEATER
FROM OIL BURNER
SIMPLIFIED PIPING DIAGRAM
TANK SUCTION BELL

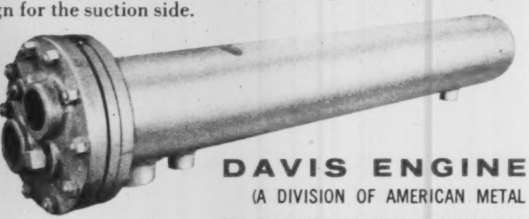
HIGH CAPACITY OUTPUT IN LIMITED SPACE

This famous Paracoil Tubular Fuel Oil heater, using steam as the heating medium, provides remarkably high heat transfer rates. Space requirements and weights are at a minimum.



SUB-WATER LINE OR STEAM SYSTEMS

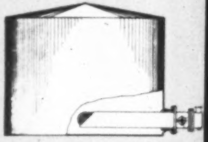
The Paracoil U-Tube type Fuel Oil Heater has been a standard of the fuel oil heating industry for years, can be used for sub-water line or with steam. Features a 6-pass design for the discharge side of the oil pump—a 2-pass design for the suction side.



DAVIS ENGINEERING
(A DIVISION OF AMERICAN METAL PRODUCTS CO.)
520 MAIN AVENUE, WALLINGTON, N. J

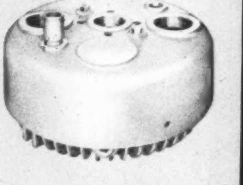
PUMPING VISCOUS NO. 6 OIL FROM STORAGE TANKS

Tank suction heaters are used to lower the viscosity of No. 6 fuel oil before it enters your circulation system. Reduces strain on the pumps. For economy of operation, only the oil being withdrawn is heated—not the entire tank contents.



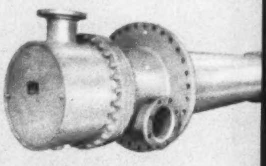
Tank Suction Bell Heaters

For small-to-moderate demand installations. Easily inserted through standard 16" tank manhole. Available in two sizes, 6 sq. ft. and 12 sq. ft. heating surface.



Horizontal Tank Suction Heaters

For higher capacity installations. Various designs to suit your own application. Model shown carries flange at inlet end for seal-off valve permitting removal of tube bundle from a full tank.



MAIL THIS CARD for information and specifications on any heater shown on this page

DAVIS ENGINEERING HPAC
(A DIVISION OF AMERICAN METAL PRODUCTS CO.)

Please send me information and specifications on the following fuel oil heaters:

- ☐ THERMO-FILM HEATERS (see reverse side of this page)
  - ☐ High pressure model
  - ☐ Low pressure model
- ☐ Tank Suction Heaters
- ☐ Tubular Fuel Oil Heaters
- ☐ Type GF Indirect Gas Fired Heater
- ☐ U-Tube Fuel Oil Heaters

My application is____________________

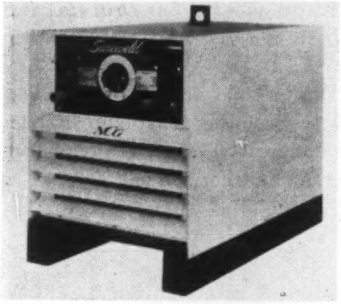
Name____________________

Title__________ **Dept.**__________

Company____________________

Address____________________

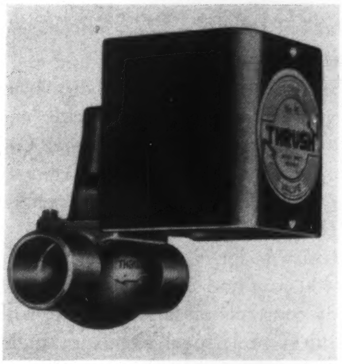
City__________ **State**__________



Arc Welder . . .

. . . in horizontal d-c design to withstand rough handling and adverse weather—*National Cylinder Gas Div., Chemetron Corp., 840 N. Michigan Ave., Chicago 11.*

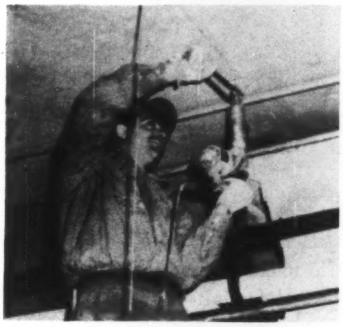
Features include dual current range with single rheostat controlling output in each range.



Zone Valve . . .

. . . for hot water heating and cooling systems—*H. A. Thrush & Co., Peru, Ind.*

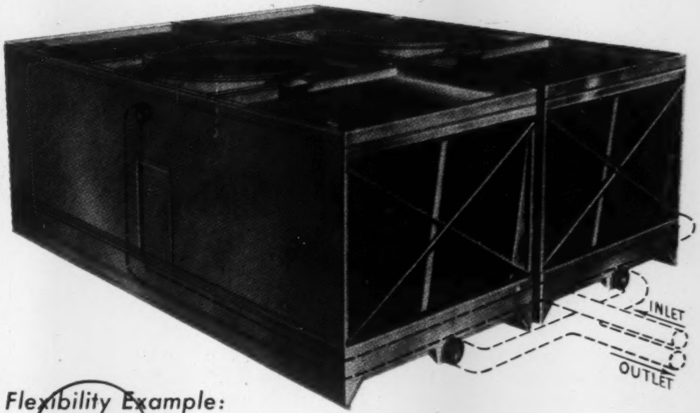
1¼ in. valve operates from standard thermostats; can be soldered into line without taking apart and can be installed in different positions.



Anchor Drill . . .

. . . for use in all phases of concrete

Havens
COOLING TOWERS
GIVE YOU
FLEXIBILITY



Flexibility Example:
Two 100 Ton Units Side by Side with Suggested Piping Method.

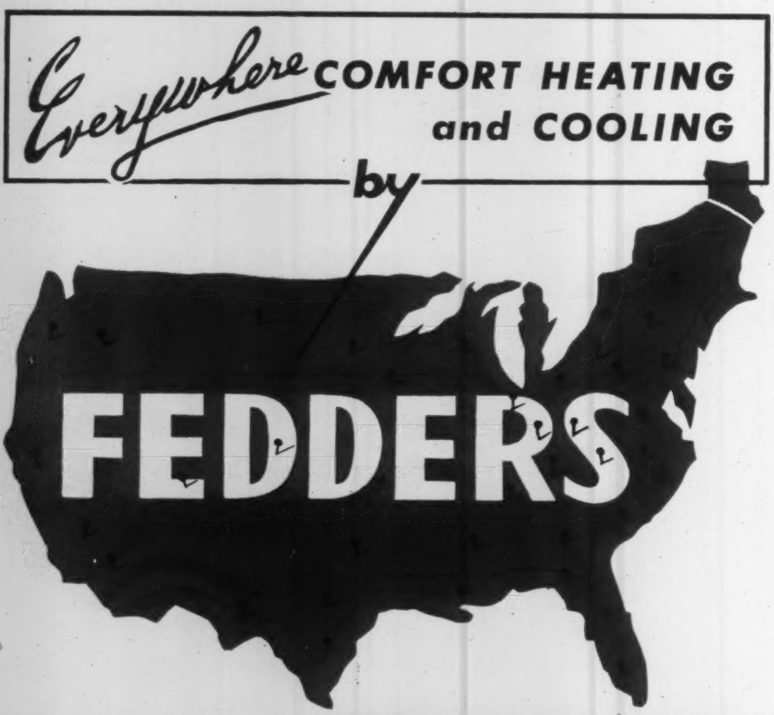
"VM" SERIES SHIPPED PRE-ASSEMBLED
Achieve Large Tonnage Installation Easily by Adding Additional Towers

Havens offers maximum flexibility with pre-assembled packaged cooling towers that **incorporate internal piping.** Large tonnage installations can be accomplished easily and at a big savings by using additional towers. Havens "VM" Packaged Towers are available in 80 - 100 - 125 and 150 ton sizes. Other capacities and styles also available.

HAVENS TOWERS FEATURE:

- **Shipped assembled ready for hoisting, piping and wiring**
- **Easily detachable hoisting yoke eliminates elaborate slings for hoisting**
- **All steel construction—hot-dipped galvanized after fabrication**
- **All heart California redwood fill**
- **Low silhouette**
- **Anti-friction ball bearings equipped with moisture barrier seals**
- **Open gravity type distribution with drilled orifices and overflow standpipe**
- **Simple installation**

Write for Literature
Havens COOLING TOWERS
Division of
HAVENS STRUCTURAL STEEL COMPANY
1713 Crystal Avenue, Kansas City 26, Missouri

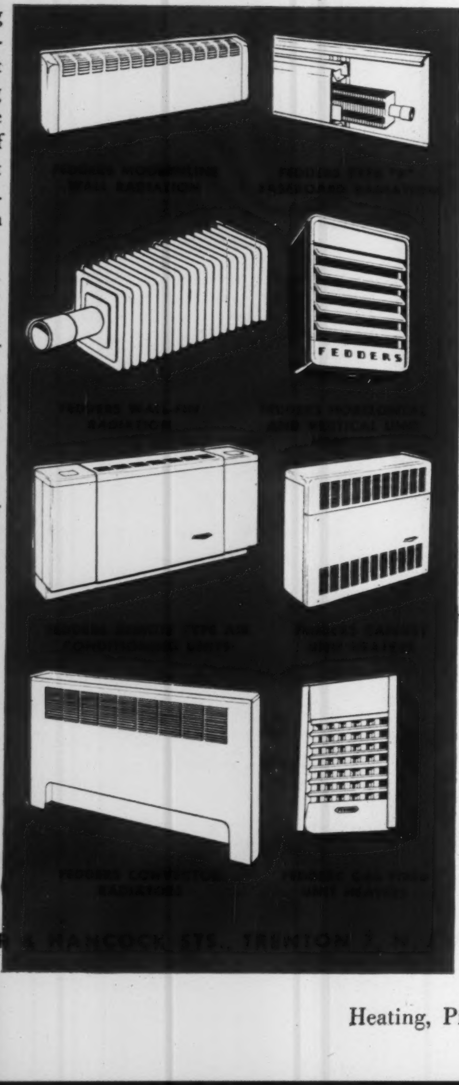


Men responsible for gaining and holding today's challenging and competitive market for superior comfort heating and cooling installations are utilizing Fedders full line of heat transfer products to meet the challenge in the new construction and modernization fields.

Whether residential, commercial, industrial or institutional ...North, South, East or West ...Fedders' complete line of advanced engineered heating and cooling units is geared to meet even the most rigid specifications.

Fedders National Representatives backed by 64 years of heat transfer experience and manufacturing skill assures the best heating and cooling equipment obtainable ... "on-the-job" when you need it!

All of Fedders products are made in a wide range of sizes and types...phone or write for catalogs giving complete engineering and dimensional data.



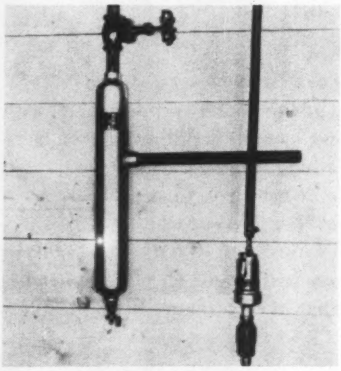
FEDDERS
CORPORATION
HEATING DIVISION, LALOR & HANCOCK STS., TRENTON 3, N. J.

EQUIPMENT DEVELOPMENTS

Continued

construction—*Phillips Drill Co., U.S. No. 12 and Liberty Trail, Michigan City, Ind.*

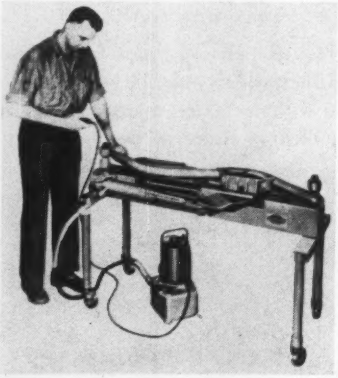
Drill is hollow core type that chews own close fitting hole; also has steel expansion shell to provide permanent threaded anchor for bolt.



Filter-Drier . . .

. . .to keep moisture and dirt from clogging and rusting pneumatic and steam tools—*V. D. Anderson Co., Div. of International Basic Economy Corp., 1935 W. 96th St., Cleveland 2, O.*

Units designed for applications up to 400 psig and 500 F temperatures; body construction is forged steel with stainless centrifugal elements; bulletin "503" available on request.

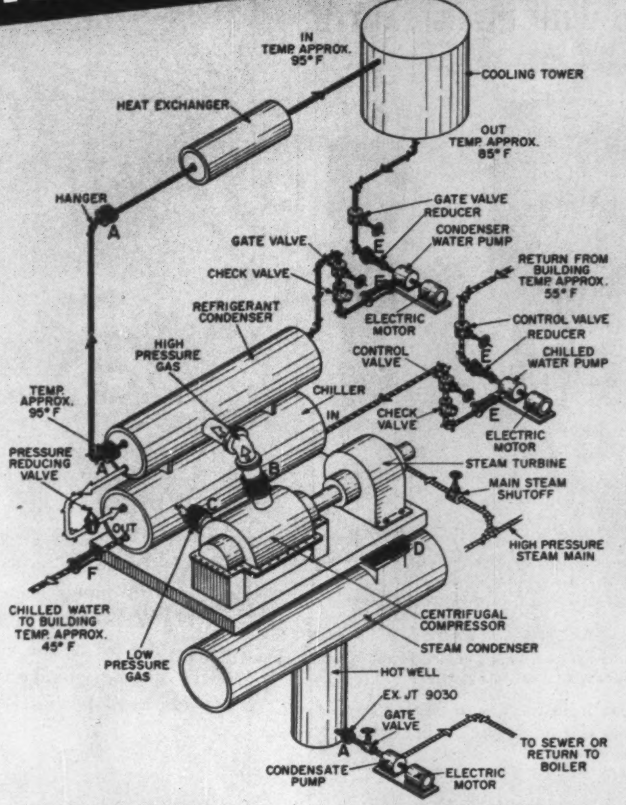


Pipe Bender . . .

. . .to make 90 and 180 deg bends in pipe and conduit—*Greenlee Tool Co., 2136 12th St., Rockford, Ill.*

Suitable for ½ to 2 in. pipe or conduit; unit develops 15 tons of

HOW TO
CONTROL VIBRATION & EXPANSION


IN TEMP. APPROX. 95° F
COOLING TOWER
HEAT EXCHANGER
OUT TEMP. APPROX. 85° F
HANGER
A
GATE VALVE REDUCER
CONDENSER WATER PUMP
GATE VALVE
E
CHECK VALVE
F
RETURN FROM BUILDING TEMP. APPROX. 55° F
REFRIGERANT CONDENSER
ELECTRIC MOTOR
CONTROL VALVE REDUCER
HIGH PRESSURE GAS
CONTROL VALVE
CHILLED WATER PUMP
E
CHILLER
IN
TEMP. APPROX. 95° F
CHECK VALVE
E
ELECTRIC MOTOR
PRESSURE REDUCING VALVE
A
B
STEAM TURBINE
MAIN STEAM SHUTOFF
OUT
C
D
HIGH PRESSURE STEAM MAIN
F
CHILLED WATER TO BUILDING TEMP. APPROX. 45° F
LOW PRESSURE GAS
CENTRIFUGAL COMPRESSOR
STEAM CONDENSER
HOT WELL
EX. JT 9030
GATE VALVE
A
TO SEWER OR RETURN TO BOILER
CONDENSATE PUMP
ELECTRIC MOTOR

a steam-driven, centrifugal-compressor AIR CONDITIONING SYSTEM

La Favorite protection for these stress points:

A Expansion Joint 9060, standard duck and rubber, for use in pressure system, absorbs axial pipeline motion.

B Expansion Joint 9030, neoprene lined. For pressure, absorbs axial and transverse motion. Neoprene acceptable for refrigerant No's 12, 13, 114, 22.

C Expansion Joint 9015 with control unit, for vacuum service. Neoprene lined for refrigerant No.'s 12, 13, 114, 22.

D Expansion Joint 5030 or 4030, for pressure service. Absorbs oscillation. Internal or external flanges.

E vibrJoint LF15R, LF25R, absorbs vibration, eliminates purchase of metal increaser or reducer. Neoprene and duck.

F vibrJoint LF15 and LF25. Neoprene and duck, eliminates water hammer.

One of a series

How Expansion and Vibration Joints Extend System Life, Reduce Maintenance

Modern air conditioning equipment, when properly installed, is designed to give long, maintenance-free service. To take full advantage of this equipment, your refrigerant and coolant pipeline systems should also be designed for long, efficient service. To do this, some basic problems common to most large systems must be solved. They are: (1) protection of the system from severe expansion and contraction, (2) absorption of pump and compressor noise, (3) protection of pipelines from misalignment and fracture caused by settling, and (4) protection of the system from electrolytic corrosion.

These problems can be solved through planned use of expansion and vibration joints. La Favorite designs and manufactures a full range of expansion and vibration joints for use in temperatures of —40°F to 250°F, and for handling brines and such refrigerants as numbers 12, 13, 114, and 22.

La Favorite expansion and vibration joints are a sound investment, whether incorporated into your system during the design stage, or used to modernize existing systems. More complete information on La Favorite products and engineering services is available on request. Write for Bulletin 982.

LA FAVORITE RUBBER MFG. CO.

256 WAGARAW ROAD, HAWTHORNE, NEW JERSEY

L-F La FAVORITE

FIELDLINK® FABRICATED PVC PROCESSING EQUIPMENT MOULDED GOODS RUBBER COVERED ROLLS PNEUMATIC GASKETS

Ask Your Air Conditioning Equipment Manufacturer for —

THE ORIGINAL LIGHTWEIGHT "PATENT APPLIED FOR," LIQUID CHARGING CYLINDERS FILLED WITH REFRIGERANT 22

Stock sizes in REFRIGERANT 22 capacities of: 50lb. - 25lb. - 15lb.

Air conditioning equipment manufacturer's brand name and no. shown on label.

Convenient for liquid charging (as shown) as well as gas charging (in standing position).

Stack conveniently to save space.

- RIGID MOISTURE AND QUALITY CONTROL
- Blue Plastic seal on valve outlet is your assurance of maximum dryness quality and purity.
- Seals are printed "MAXIMUM DRYNESS—FACTORY SEALED."
- SAVES LABOR & MATERIAL LOST WHEN RECHARGING CYLINDERS
- Saves gas left in recharging cylinders and saves losses due to leaky valves and damaged threads from continued use of present small cylinders.
- EASY TO HANDLE — lightweight, small cylinders with built-in hand grips. (50 lb. size only 22 lb. empty.) Convenient for carrying up ladder. 50 lb. size saves extra trips back to replace when empty.
- NO HOOD CAPS TO LOSE — Valve protected by permanent collar.
- STACKING RINGS SAVE VALUABLE SPACE
- Valve protection collar also serves as stacking ring. Uniform ring on all sizes enables mixed stacking.
- CAN BE USED IN BOTH UPRIGHT POSITIONS
- Equally convenient for gas or liquid charging.
- No mounting blocks necessary.
- NO VALVE WRENCHES NEEDED — Handwheel already on cylinder valve.
- STANDARD FITTING ALREADY ON VALVE
- Sturdy cylinder valve complete with flare nut ready for charging connection to standard 5/16 O.D. tubing. Also adapter to fit 1/4" charging hose supplied at no charge.
- YOU CAN DELIVER AIR CONDITIONING SYSTEM COMPLETE WITH FULL REFRIGERANT CHARGE ANY TIME OF THE YEAR
- NO FREIGHT OR DEPOSIT PROBLEMS ON CYLINDERS
- Prices include freight on full cylinders and on return of empties.
- No cylinder records needed—deposit of $12.00 each for all three sizes of cylinders refunded regardless of cylinder number.

ASK FOR THE BLUE CYLINDER WITH THE PROTECTING STAND RING — THEY FIT ON PORTABLE BATHROOM SCALES IN LIQUID CHARGING POSITION FOR WEIGHING IN CHARGE

Air Conditioning Equipment Manufacturers Send Inquiries to:

PENNSYLVANIA ENGINEERING CO.

1107-21 NORTH HOWARD STREET PHILADELPHIA 23, PENNA.

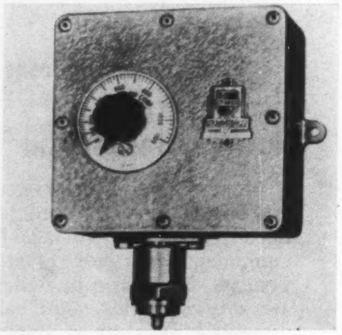
Patent Applied For

ram pressure; can be hand or power pump operated; complete specifications available in descriptive bulletin "E-234" available on request.

Solenoid Valves . . .

. . . designed for use with air, oil, and water, *Skinner Electric Valve Div., 105 Edgewood Ave., New Britain, Conn.*

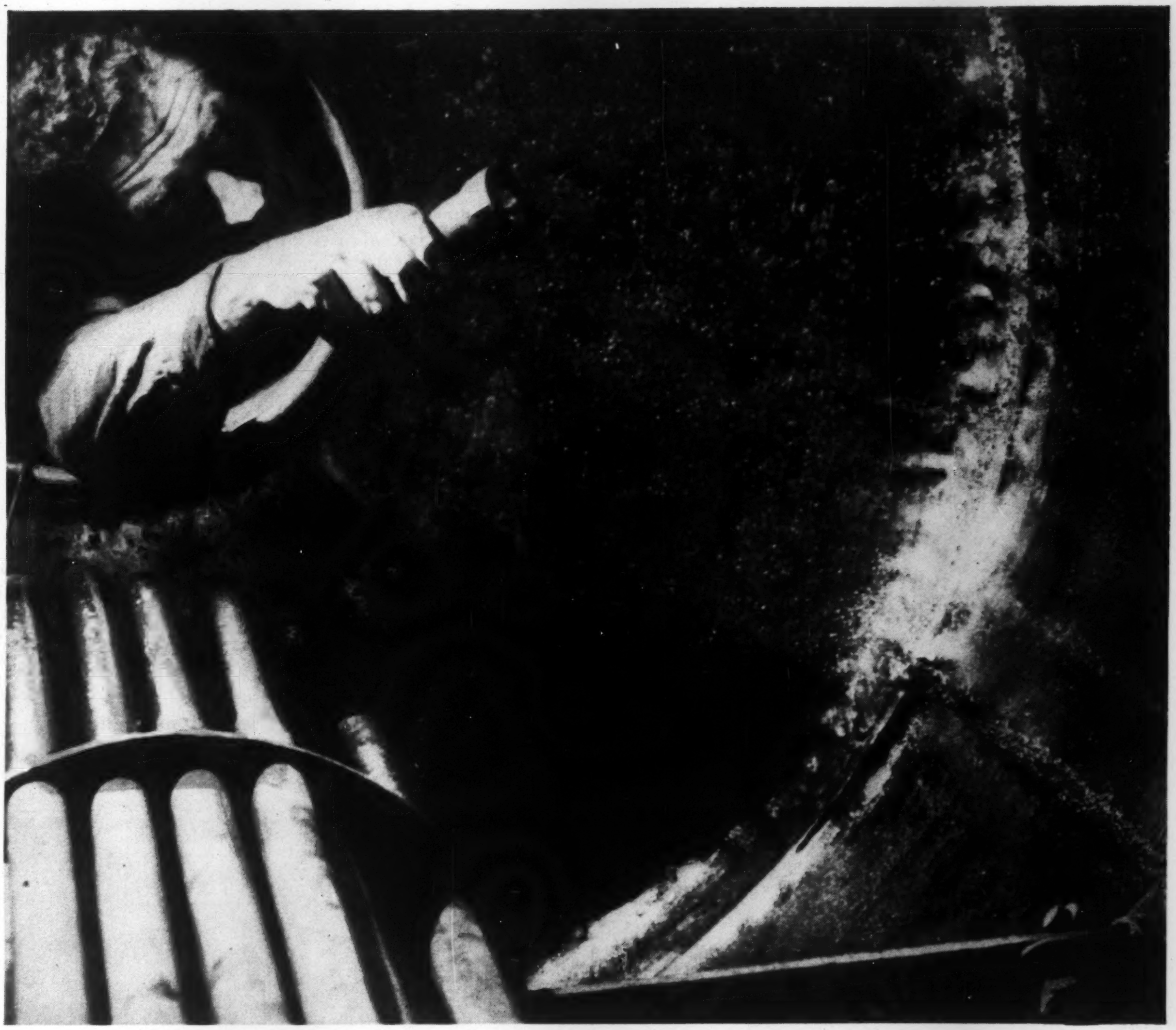
Pilot-operated valve available in wide range of voltages and frequencies with many electrical options; operating pressure differentials are 5 to 1250 psi on a-c voltage, 5 to 1000 psi on d-c voltage; descriptive bulletin available on request.



Temperature Control . . .

. . . to control either refrigeration or heating equipment—*Partlow Corp., 530 Campion Rd., New Hartford (Utica), N. Y.*

Control can be used to regulate flow of steam, oil, gas; electricity for heating appliances; may be obtained in two sensitivities; normal: 1 percent of scale range; close: 1/2 percent of scale range; bulletin "410" available on request.



Still no sign of wear or corrosion in Patterson-Kelley storage water heater

AFTER 26 YEARS OPERATION

Credit Revere Copper for this outstanding performance

The copper-lined heater you see above was installed in the Bronx County Courthouse Building, New York City, in 1932, and processes rust-free hot water for the 1,000 staff members and more than 5,000 visitors daily.

Department engineers inspected the heater annually, the last inspection being in June, 1958. At that time the above photo was taken of the heater's interior. After 26 years constant use, processing over 8,500,000 gals. of water at the average rate of 4 tons per day, the heater was found to be in excellent condition, all original fittings in good operating condition and copper tube bundles and supports showed not one sign of wear or corrosion. Once again copper has proved a most efficient, economical and durable material in storage water heater service.

Find out how copper and its alloys can help you in your corrosion problems, whether it be storage water heaters, heat exchangers, condensers or distillation units. Call on Revere's Technical Advisory Service with its great storehouse of knowledge on this subject.

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Founded by Paul Revere in 1801
Executive Offices:
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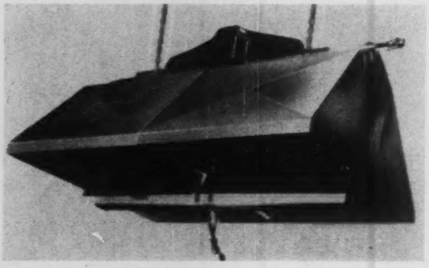
Mills: Rome, N. Y.; Baltimore, Md., Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities. Distributors Everywhere.

EQUIPMENT DEVELOPMENTS

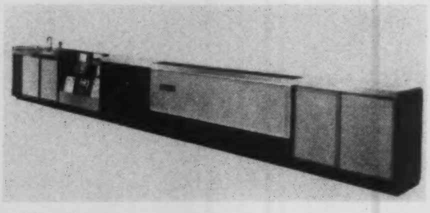
Continued



Infrared Heater . . .

. . .featuring aluminum hood to concentrate radiant beam—*Panelbloc Div., Bettcher Mfg. Corp.*, 3106 *W.* 61*st St., Cleveland, O.*

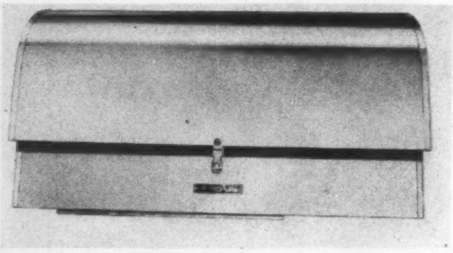
Available in two sizes, one with 62,000 Btu input, other has 125,000 Btu input.



Unit Ventilator . . .

. . .for hot water, steam, direct-fired gas, electric systems—*Herman Nelson School Air Systems Div., American Air Filter Co.*, 215 *Central Ave., Louisville* 8, *Ky.*

Designed to be used in classrooms where functional equipment is important; provides wide range of colors to meet school environmental needs; piping, pipe insulation, condensate drainage system and control system are engineered and sized for air conditioning; accessory pieces include sink-and-bubbler unit, magazine rack, storage cabinets for use in classroom.



Roof Ventilator . . .

. . .in complete range of sizes from $10\frac{3}{4}$ to $48\frac{1}{2}$ in. wheel diam—*Carnes Corp., Verona, Wisc.*

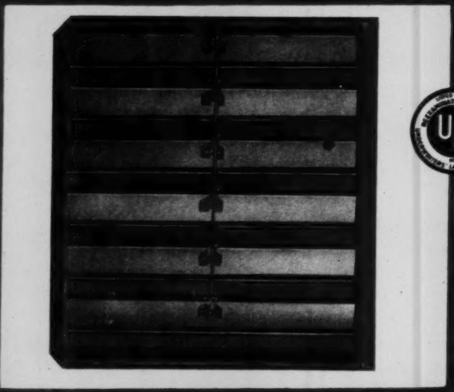
Features low silhouette design of galvanized steel with hinged motor hood; motor, belt, pillow block bearings out of airstream; single phase motors through 1 hp have built in auto-reset thermal overload protector; bulletin "659" available on request.

FIRST and ONLY FIRE DAMPER
TO RECEIVE THE UNDERWRITERS' LABORATORIES APPROVAL

(Based on a 1½ hour test)

This acceptance by the UNDERWRITERS' LABORATORIES came only after extensive tests with FIRE DAMPERS constructed according to the present Bulletin No. 90 SERIES, which failed to pass the test, and the IMPERIAL DAMPER No. VWNYT-1, which passed the test, and now carries the UNDERWRITERS' LABORATORIES LABEL.

We, also, at this time, proudly announce the APPROVAL AND LABELING of the IMPERIAL DAMPER No. VWNYT-1 by the BOARD OF STANDARDS AND APPEALS FOR USE IN NEW YORK CITY. This is the FIRST AND ONLY DAMPER to date to carry this approval and label.



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AUTOMATIC LOUVERED FIRE DAMPER

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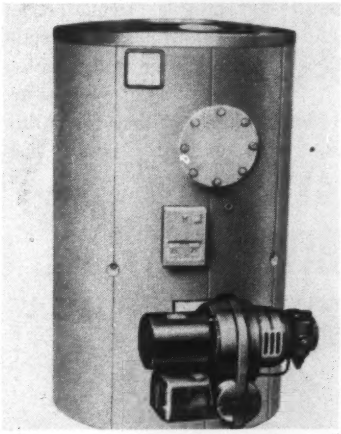
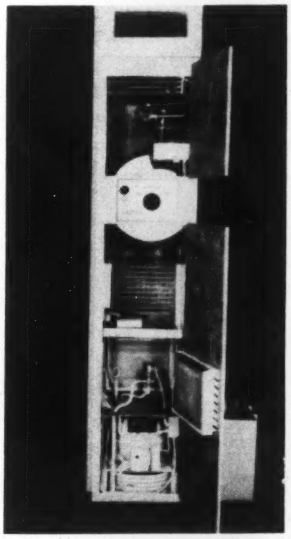


Water Heater . . .

. . . for applications wherever large quantities of hot water are required —*Portmar Water Heater Co., Inc., 193 Seventh St., Brooklyn 15, N. Y.*

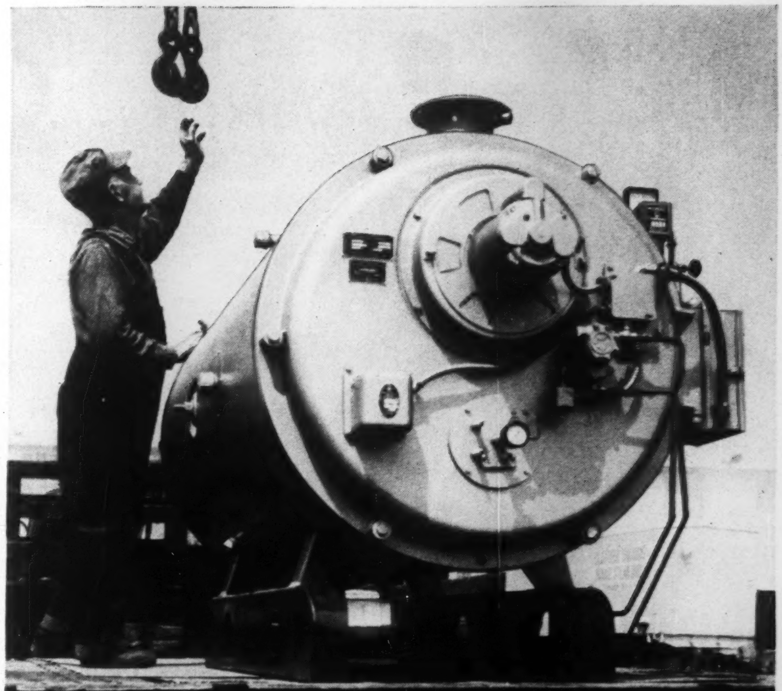
Offered in 4 sizes ranging from 135 to 300 gph; have 100 F temperature rise and have been tested under 300 psi working pressure.



Heating, Cooling Unit . . .

. . . designed for office buildings, apartments, hotels, motels—*Kritzer Products, Div. of Peerless of America, Inc., 5800 N. Pulaski Rd., Chicago.*

Utilizes hot and chilled water and incorporates high level discharge and low level return; system is basically gravity hot air and gravity cold air circulation, in which fan supple-



profits come packaged:

Cleaver-Brooks Progress boilers pay off in time and labor savings

PROGRESS BOILER PROVES good things come in a *complete* package — especially when it comes to boilers. No need for you to do the manufacturer's work. No costly time-waste, boiler-building on the job!

Because Progress is a completely pre-engineered, factory-tested package — ready for hook-up to service lines — you save up to two days on installation alone.

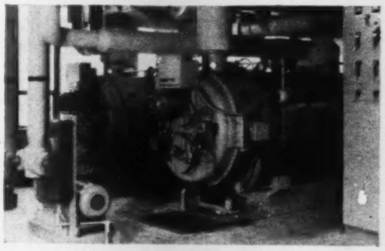
PROFITS PROVE THE PACKAGE
And when it comes to worry-free installation, Cleaver-Brooks leaves nothing undone. Field starting service is just one example. A Cleaver-Brooks technician starts the boiler, trains the boiler attendant at no extra cost.

And Progress is easy to sell with quiet, low-cost operation. Four-pass, forced draft design means guaranteed efficiency; electronic controls, soft flame start.

The Progress boiler is built to the standards of industrial boilers. Available in 7 sizes to 2,010,000 Btu—oil, gas or combination oil/gas fired models.

You'll profit as a Progress contractor. For your Progress *Cooperative Wholesaler* contact your local Cleaver-Brooks sales representative listed in the yellow pages, or write Cleaver-Brooks Company, Dept. A, 313 E. Keefe Ave, Milwaukee 12, Wisconsin.

Cleaver Brooks®
TO MAKE PROGRESS SELL PROGRESS



Cleaver-Brooks boilers are available in 19 sizes, 130 models, 15 to 600 hp. — steam or hot water, gas, oil or combination oil/gas fired. Illustration shows Model CB boiler as installed at Whirlpool Corp., St. Joseph, Michigan.

CUT 20" CAST IRON PIPE
in Less Than 8 Minutes...

...with the New REED
ROTARY CUTTERS
(4 sizes cover the range from 10" cast iron to 26" steel pipe)

These one-man Reed Rotary Cutters cut large diameter steel or cast iron pipe *faster and better than the heaviest power machines* . . . and without electrical or explosive hazards. What's more, there's less digging in ditch-work! You need only a 4" to 6" channel under the pipe and a 45° to 60° arc for the handle swing. Reed Rotaries are easy to "carry in", too. The 20" size weighs only 68 pounds; separates into 3 easily carried parts. Patented pipe guide assures clean, right-angle cuts. Four razor blade wheels track perfectly, cut easily and are quickly interchangeable for steel or cast iron pipe.

- Write today for descriptive literature.

These typical cuts on 12, 16, 20 and 24" cast iron pipe illustrate the clean, accurate, right-angle cuts provided by Reed Rotary Cutters.

REED
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REED MANUFACTURING COMPANY
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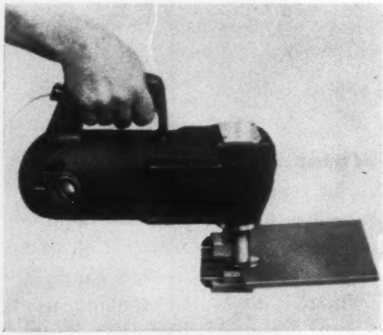
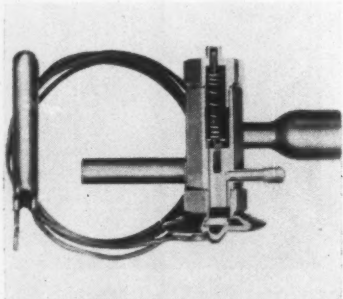
ments only natural circulation, operating on both cycles in direction air would travel naturally without fan; 4 essential parts of systems are: standard boilers; chillers for chilling water; fan unit in various sizes; plenum chamber.



Portable Nibbler . . .
. . . for template making—*Fenway Machine Co., 3107 N. Broad St., Philadelphia 32, Pa.*

Cuts 1/4 in. steel plate and 5/16 in. aluminum where necessary to retain original contour; has 2½ hp universal type for a-c or d-c, 115 v up to 60 cycle.



Expansion Valve . . .
. . . to meet demands of high pressure heat pump installations—*Controls Co. of America, Heating & Air Conditioning Controls Div., Milwaukee 10, Wisc.*

Designed to meet reverse cycle pressure reaching 450 psig found in heat pump systems; controls nominal pressures of 50 to 70 psig in stand-

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① 50 years of pump manufacturing experience.

② Balanced impellers passing large spheres provide quiet operation with high pump and high non-clogging efficiency.

③ Expansion joints in discharge pipe prevent pump distortion and resulting bearing failures.

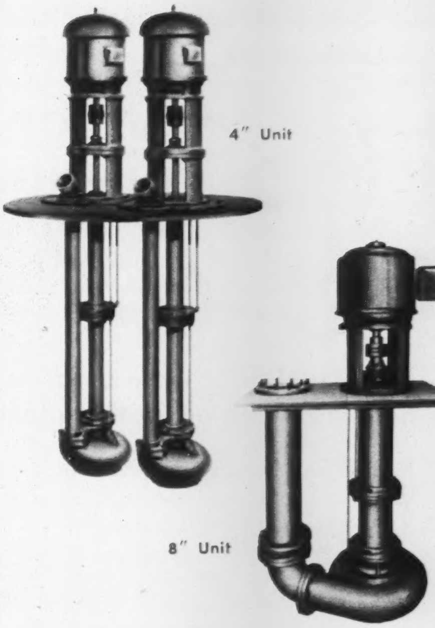
④ Simple, dependable micrometer adjustment permits easy setting of impeller clearance in pump casing to compensate for normal wear, maintaining maximum efficiency.

⑤ Heavy ball thrust bearings are located well above floor level to prevent water splashing into bearings.

⑥ Packing boxes built into floor plates prevent leakage.

⑦ Heavy duty shafts and bearings eliminate vibration and provide long life.

1959 50 YEARS CHICAGO PUMP COMPANY 1909



FOR . . . handling sewage and drainage in buildings and industrial plants and for municipal sewage disposal.

SIZES . . . available in sizes from 4" to 8", with capacities from 50 to 3500 G.P.M.

Now available with *the new* SEALTRODE* Sealed Electrode Floatless Pump Controller . . . the *only* Controller featuring completely sealed Electrodes . . . positively preventing insulation or coating by grease or other corrosive elements.

Over 50,000 installations.

Write direct or contact Chicago Pump Company Distributors located in most principal cities for Bulletin 124-F and complete engineering data.

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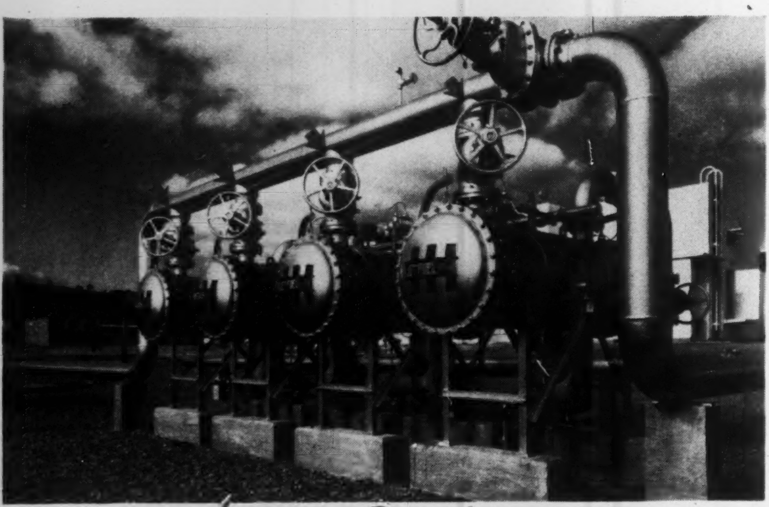
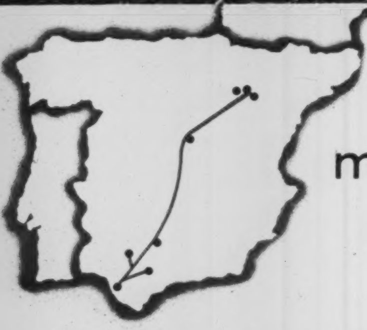


Markowitz Bros. Inc., Mechanical Contractors
Miami, Florida



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WELDOLETS were used for all branch connections on pumping station piping

Reinforced branch connections constructed with Weldolet Welding Fittings provide assurance of quality workmanship at the critical branch connection.

Savings in purchase price and construction on this project alone were high in the six figures. Piping designers and contractors who are interested in similar savings on their jobs are invited to write us for the Bonney Spanish Pipeline Brochure.

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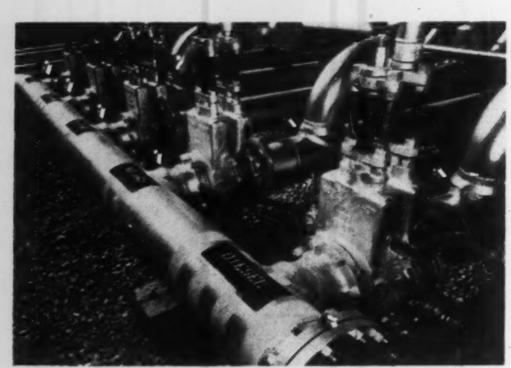
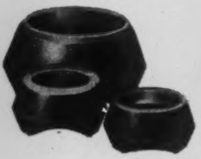




BONNEY FORGE and TOOL WORKS
ALLENTOWN, PENNSYLVANIA

ard refrigeration systems; inlets are standard in 3/8, 1/2, 5/8 in. O.D. solder; outlets are 5/8, 7/8, 1 1/8 in. O.D. solder; external equalizer is 1/4 in. O.D. solder.

Pipe Thawer . . .

. . . to thaw out frozen embedded pipe without fire hazard—*Trindl Products, Ltd.*, 1807-11 *S. Clark St., Chicago* 16.

Comes with 40 ft of secondary output cable, two pipe clamps, 10 ft of power cord with plug; has two heat taps, 200 amp and 500 amp; each tap automatically regulates proper amount of current and voltage required for various sizes and length of pipe.

Core Drill . . .

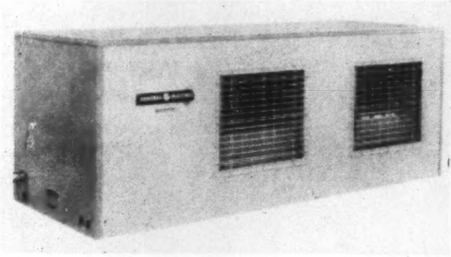
. . . featuring air-vacuum mounting base—*Diamond Core and Saw Div., Portomag, Inc.*, 1521 *East Nine Mile Rd., Ferndale* 20, *Mich.*

Drill has penetration of 1 to 4 in. per min; diamond bits available for 1/4 to 14 in. diam cores; operates on 110 v a-c—d-c.

Pipe Channels . . .

. . .for making up adjustable pipe suspension system—*Fee & Mason Mfg. Co., Inc., Manasquan, N. J.*

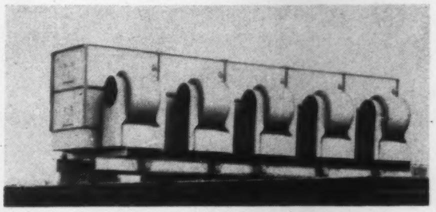
Available in four basic preformed sizes; system consists of preformed channel, framed fittings, hangers, accessories.



Heat Pump . . .

. . .designed for installation in commercial applications—*General Electric Co., Air Conditioning Dept., Troup Highway, Tyler, Texas.*

Outdoor units available in 2½, 3 ton capacity integral models and split-systems of 2½, 3, 4, 5 tons; features hermetic compressor, large permanently lubricated ball bearing blowers, electrically operated, positive-acting 4 way switchover valve; unified automatic electrical controls for heating, cooling, and fully automatic defrosting.



Cooling Towers . . .

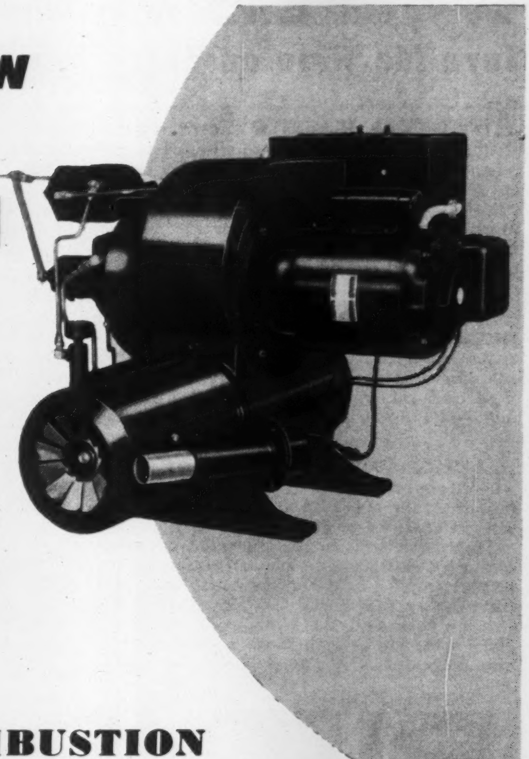
. . .featuring low silhouette—*Binks Mfg. Co.,* 3114 *Carroll Ave., Chicago* 12.

Available in 16 models from 5 to 360 tons; all models constructed of heavy gage galvanized steel; towers have squirrel cage blowers.

Electric Heaters . . .

. . .including wall insert heaters and baseboard radiation panels—*Carrier Corp., Syracuse* 1, *N.Y.*

Wall insert heaters offered in 4 sizes ranging in input capacities from 1500 to 4000 watts; baseboard panels available from 2½ to 8 ft lengths and 300 to 1250 watt capacities; also features forced air fan and built-in thermostat.



Keep heating costs low with HEV-E-OIL commercial-industrial burners

Hev-E-Oil burners furnish all the air necessary for combustion, assuring perfect fire control under all weather conditions. Low fire start that builds up gradually to the flame size required means smooth, safe operation. And once the burner is set for greatest efficiency, it *stays* that way no matter what the weather.

A complete package! Fire tested! Automatic, electronic controls. Meets all codes. Easy to install . . . Hev-E-Oil models from 5 to 150 gph. Also available, Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 B.T.U.

For more information write Industrial Combustion, Inc., 4507 N. Oakland Ave., Milwaukee 11, Wis., Dept. HPA-160.

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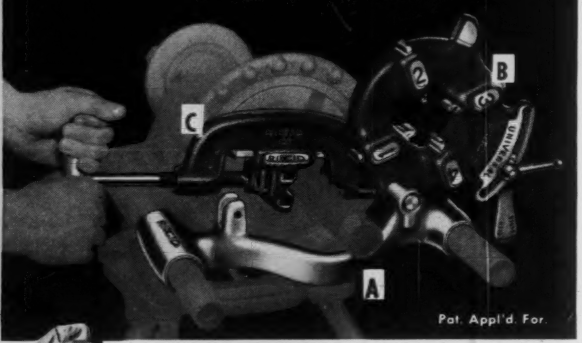

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"3 Efficient, New RIDGID Accessories Save Me Time on Every Job!"

A RIDGID No. 310 Carriage — Slip this strong, lightweight aluminum alloy carriage on the support arms of your RIDGID 300 Power Drive, and you'll get real cut-and-thread efficiency! Holds die head and cutter at your fingertips exactly like a pipe machine. No fumbling for right size threader . . . no tools to drop. Easy sliding . . . snugs right up to chuck for close threading and cut-off.

B RIDGID Die Heads — The time-saving RIDGID 535 Quick-Opening Die Head shown here, or any other RIDGID Machine Pipe and Bolt Die Head, snap-locks into carriage quickly, easily . . . eliminates slow back-off. Single adjustment on carriage centers die head exactly for true threads every time.

C RIDGID No. 360 Cutter — Full-floating, wheel-type cutter . . . wide rolls for straight cuts at pipe machine speed. Attaches easily with swivel drive pin. Fits 310 carriage only.

Die head and cutter operate independently . . . swing up and stay out of way when not in use. Add a RIDGID No. 19 Nipple Chuck and you can even thread close nipples.

For a bargain in fast, easy work, equip your RIDGID 300 Power Drive with these accessories that are available individually . . . at your Supply House!

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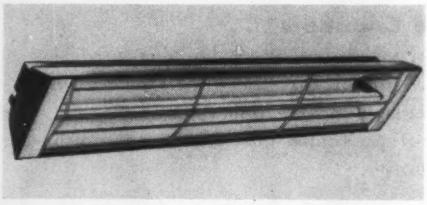


Infrared Heaters . . .

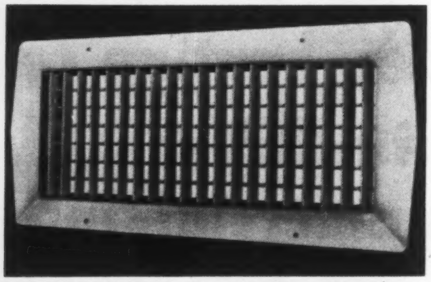
. . . for use where desirable to direct heat to specific area without heating adjacent areas—*Apextro Products Co., Div. of Apex Sheet Metal Works, Inc.*, 1821 *N. Eastlake Ave., Los Angeles* 31, *Calif.*

Unit features semi-parabolic reflectors and end reflectors for optimum coverage; available in 23 models.

Portable Crane . . .

. . . for lifting and moving heavy or awkward loads for marine and general shop use—*Thern Machine Co.*, 3760 *W. Fourth St., Winona, Minn.*

Maximum lift capacity is 1250 lb with boom fully retracted to 34 in. and mast and brace fully retracted to lifting height of 8 ft, 8 in.; will lift 750 lb to height of 14 ft.



Nylon Grilles . . .

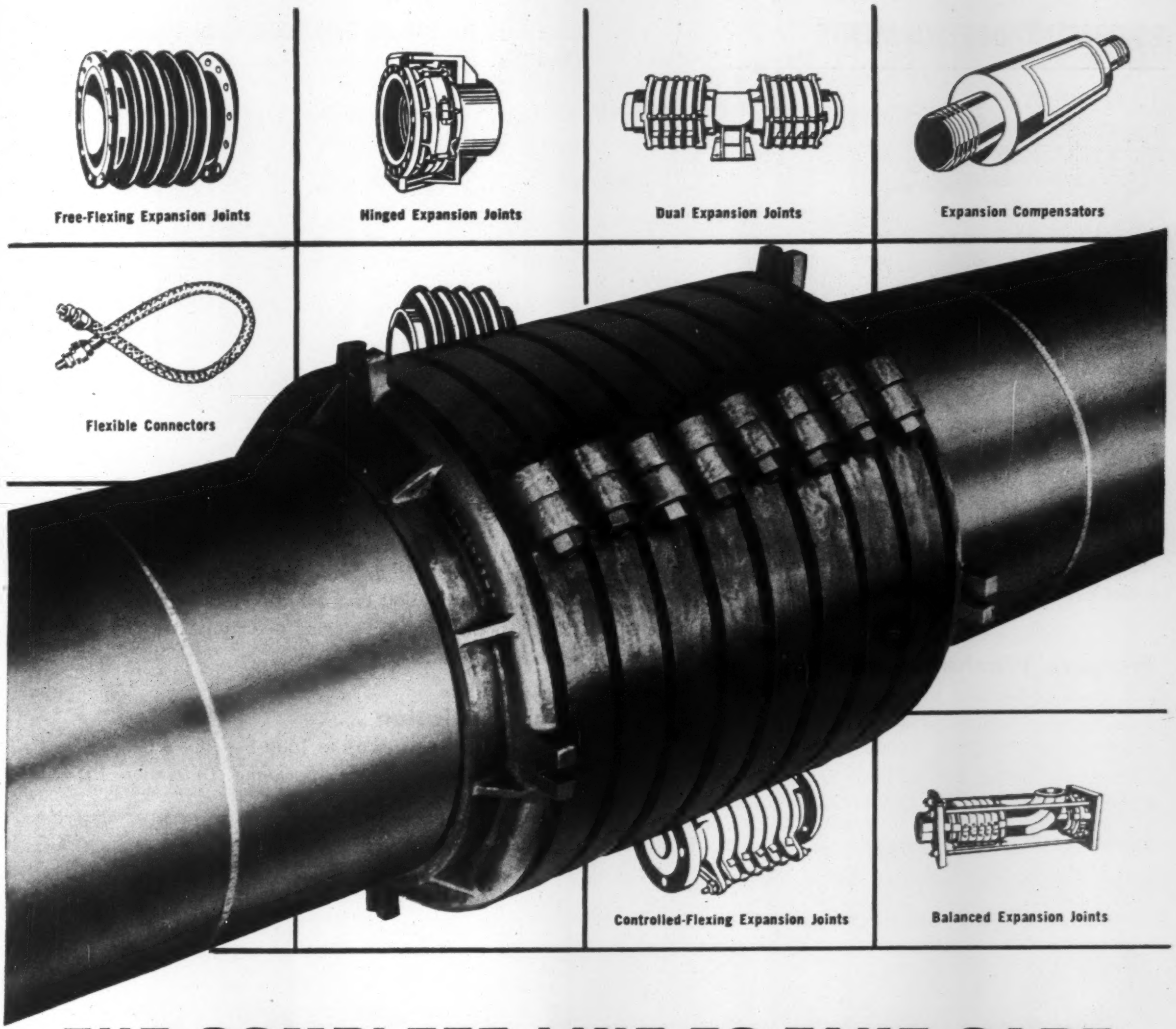
. . . permitting permanent air-tight closure against wall wall or ceiling without use of gaskets—*Airguide Plastics Corp.*, 20 *S.E. Third Ave., Miami* 32, *Fla.*

Available in single or double deflection types with individually adjustable air-foil bars; obtainable in vertical or horizontal bar mountings; descriptive brochure available on request.

Steam Traps . . .

. . . to prevent freeze-up of tempering coils—*V. D. Anderson Co., Steam Specialties Div.*, 1935 *W. 96th St., Cleveland* 2, *O.*

Unit is combination inverted bucket and thermostatic steam trap which drains, and vents air; according to manufacturer, has quick-venting and high condensate drainage capacity.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THE COMPLETE LINE TO TAKE CARE OF ANY KIND OF PIPE MOTION

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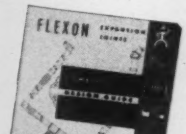
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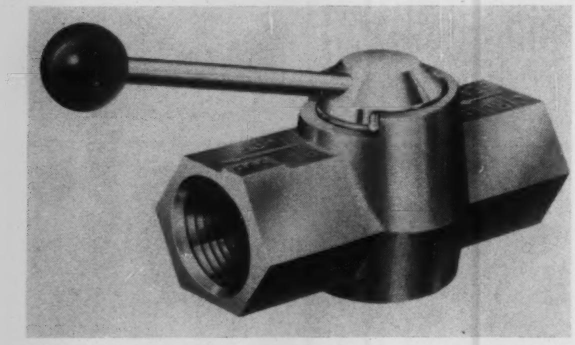
EQUIPMENT DEVELOPMENTS *Continued*



Plug Valve . . .

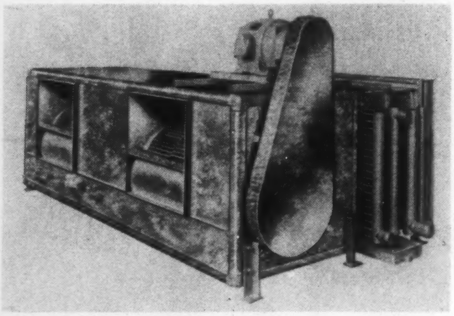
. . .for use with corrosive liquids and gases—*Circle Seal Products Co., Inc.,* 2181 *E. Foothill Blvd., Pasadena, Calif.*

Available in $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ in. female pipe; valve is for pressures ranging from full vacuum to 150 psi.

Pressure Washer . . .

. . . to clean heating and air conditioning condensers, coils, filters—*Pressure Wash Mfg. Inc.,* 2333 *W. Wells St., Milwaukee* 3, *Wisc.*

Pressure is sustained at 150 psi delivering 3 gpm at gun; bulletin "SW-150" available containing full specifications.



Air Handling Units . . .

. . .for air conditioning, ventilating, or heating—*Recold Corp.,* 7250 *E. Slauson Ave., Los Angeles* 22, *Calif.*

Features modular design in which blower section is independent from coil sections; units are rated from 800 to 34,000 cfm for direct expansion, chilled water, hot water, and steam; descriptive catalog available on request.

Pipe Insulation . . .

. . . for temperatures up to 1600 F—*Philip Carey Mfg. Co.,* 320 *S. Wayne Ave., Lockland, Cincinnati* 15, *O.*

STAINLESS

pipe and fittings

Your complete stainless piping package is available for immediate shipment in a variety of sizes and analyses. **Pipe:** $\frac{1}{8}$ ips through 12" ips seamless and welded, schedules 5-80. **Fittings:** $\frac{1}{8}$ ips through 4" ips, threaded and welding type. **Valves:** $\frac{1}{4}$ ips—2" ips. Also **mill shipments** of corrosion resistant items up to 48" OD. Send for FREE literature.

C. A. ROBERTS CO. *Steel Tube Specialists*

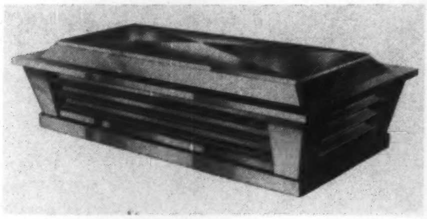
Dept. F • 2401 25th Avenue • Franklin Park, Illinois

6 Warehouses serving the middlewest CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • TULSA • KANSAS CITY

EQUIPMENT DEVELOPMENTS

Continued

Composed of expanded silica with specially developed binder and reinforced with inorganic fiber; has application to chemical process industries; full details in form "6409" available on request.



Roof Ventilators . . .

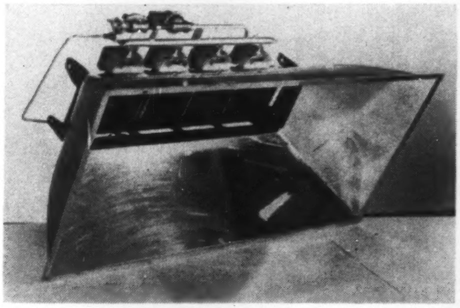
. . . for use where low silhouettes are desired by engineers and architects—*G. C. Breidert Co., P.O. Box 1190, San Fernando, Calf.*

Available in range of sizes from 10 through 60 in. diam; engineering data book "60-1" available on request.

Portable Chiller . . .

. . . to cool an independently built work space or to augment capacity of other air conditioning equipment —*Tenney Engineering, Inc., 1090 Springfield Rd., Union, N.J.*

Available in 12 standard models with following capacity span: at −40 F brine temperature or −60 F evaporator temperature, capacity is from 3240 to 34,000 Btu per hr; at −100 F brine temperature or −120 F evaporator temperature, capacity ranges from 660 to 7000 Btu per hr.



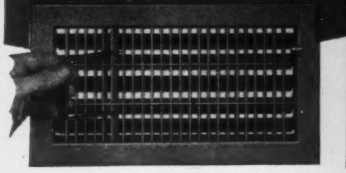
Infrared Heaters . . .

. . .for heating high ceilinged buildings—*Perfection Industries, Div. of Hupp Corp., 1135 Ivanhoe Rd., Cleveland 10, O.*

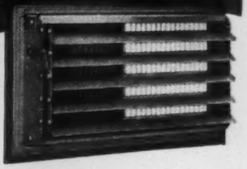
Heaters available in output from 12,000 to 48,000 Btu per hr; controls and ignition systems adapt units for firing with natural, LP, mixed or manufactured gas.

DIRECTED AIR FLOW
at any angle with

INDEPENDENT
"Fabrikated"
REG. U. S. PAT. OFFICE
AIR CONDITIONING
REGISTERS

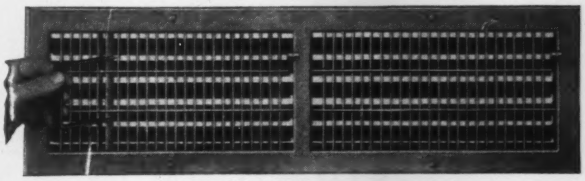


321-A HMV



Rear View Showing "HMV" Valves

Every grille bar adjustable individually—before or after installation



321-A HMV Tandem

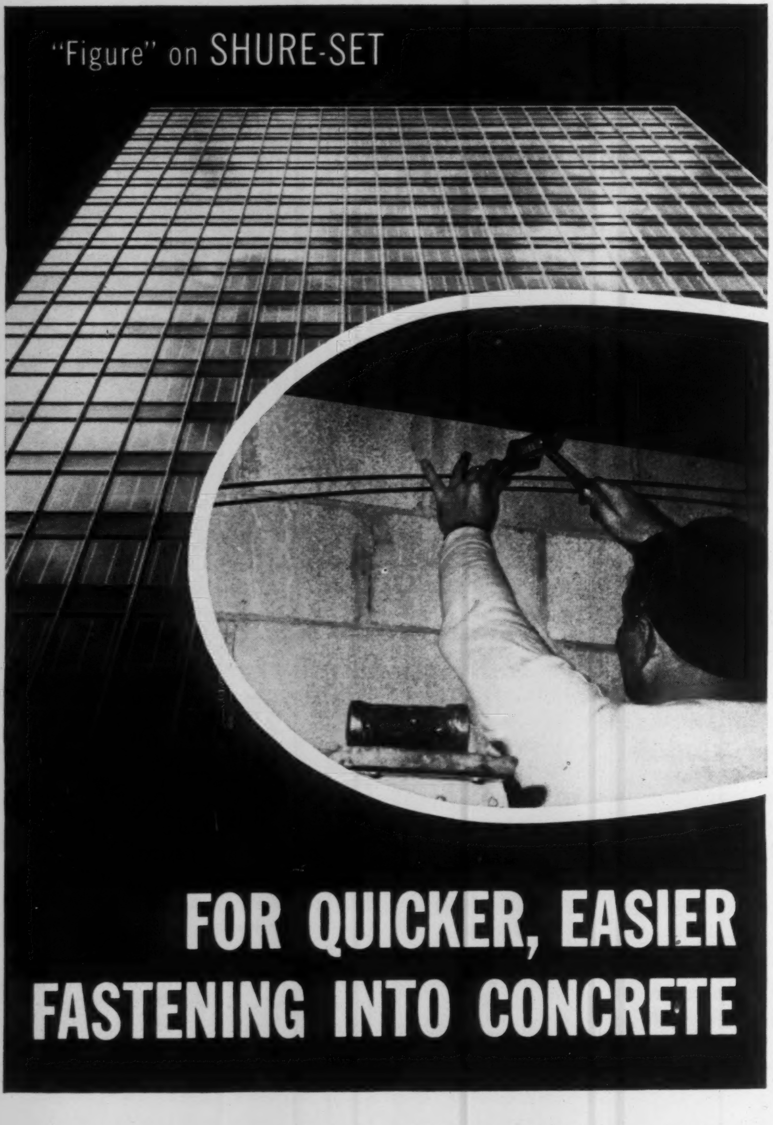
Any direction of air flow—right, left, up, down and any combination—is easily obtained with "Fabrikated" Style No. 321-A HMV air conditioning registers, for residence or commercial installations, on sidewalls or ceiling. The face bars are adjustable to right or left; valves on the back are adjustable to direct the air flow up or down; valves may also be fully closed, and are connected to open or close in unison.

The angles of deflection and the combinations to be had are practically unlimited. Adjustments for directed air flow may be made before or after installation. Grille bars are held firmly in place and will not vibrate or rattle. "Fabrikated" registers are available in sizes from 8 x 4" to 48 x 24", including tandem style. Special sizes can be made without special die set-up charges.

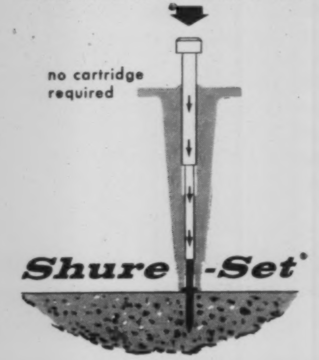
Write for Catalog.

THE INDEPENDENT
REGISTER CO.
3747 E. 93rd STREET · CLEVELAND, OHIO

"Figure" on SHURE-SET



FOR QUICKER, EASIER FASTENING INTO CONCRETE



Contractors everywhere are discovering that Shure-Set is a tremendous time- and work-saver on fastening temperature control systems and countless other plumbing, heating and air-conditioning jobs. This hammer-in tool sets threaded studs, drive pins, and wire loops into concrete without pre-drilling, filling or plugging. And it doesn't require a cartridge!

Just place fastener in the head of the tool, position against work surface, then drive fastener home with a few hammer blows. The secret is in the unique energy-transfer principle of Shure-Set.

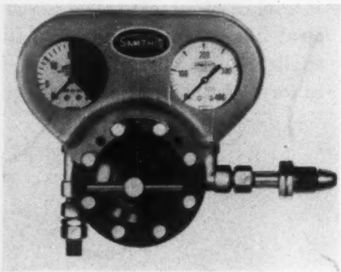
And remember Ramset for heavy-duty fastening. Write direct or call your dealer (under "Tools" in Yellow Pages) for details.

... another product by

Ramset® Fastening System

OLIN MATHIESON Chemical Corporation
WINCHESTER-WESTERN DIVISION
291-A Winchester Ave. • New Haven 4, Conn.

EQUIPMENT DEVELOPMENTS
Continued



Welding Regulator . . .

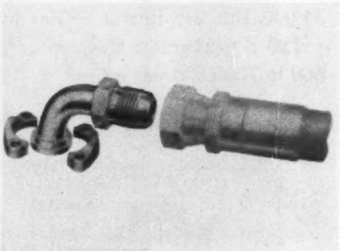
. . . for use with oxygen, acetylene and LP gases—*Smith Welding Equipment Corp., 2633 Fourth St. S.E., Minneapolis 14, Minn.*

Features include enclosed gages, prevention of reverse flow and mixture of gases, safety inlet connector to fit inlet connection to regulator.

Tube Coils . . .

. . . in new line of 3/8, 1/2, 5/8 in. sizes—*Tenney Engineering, Inc., 1090 Springfield Rd., Union, N.J.*

New 5/8 in. pattern has been incorporated in all aluminum encased coil.



Hose Fittings . . .

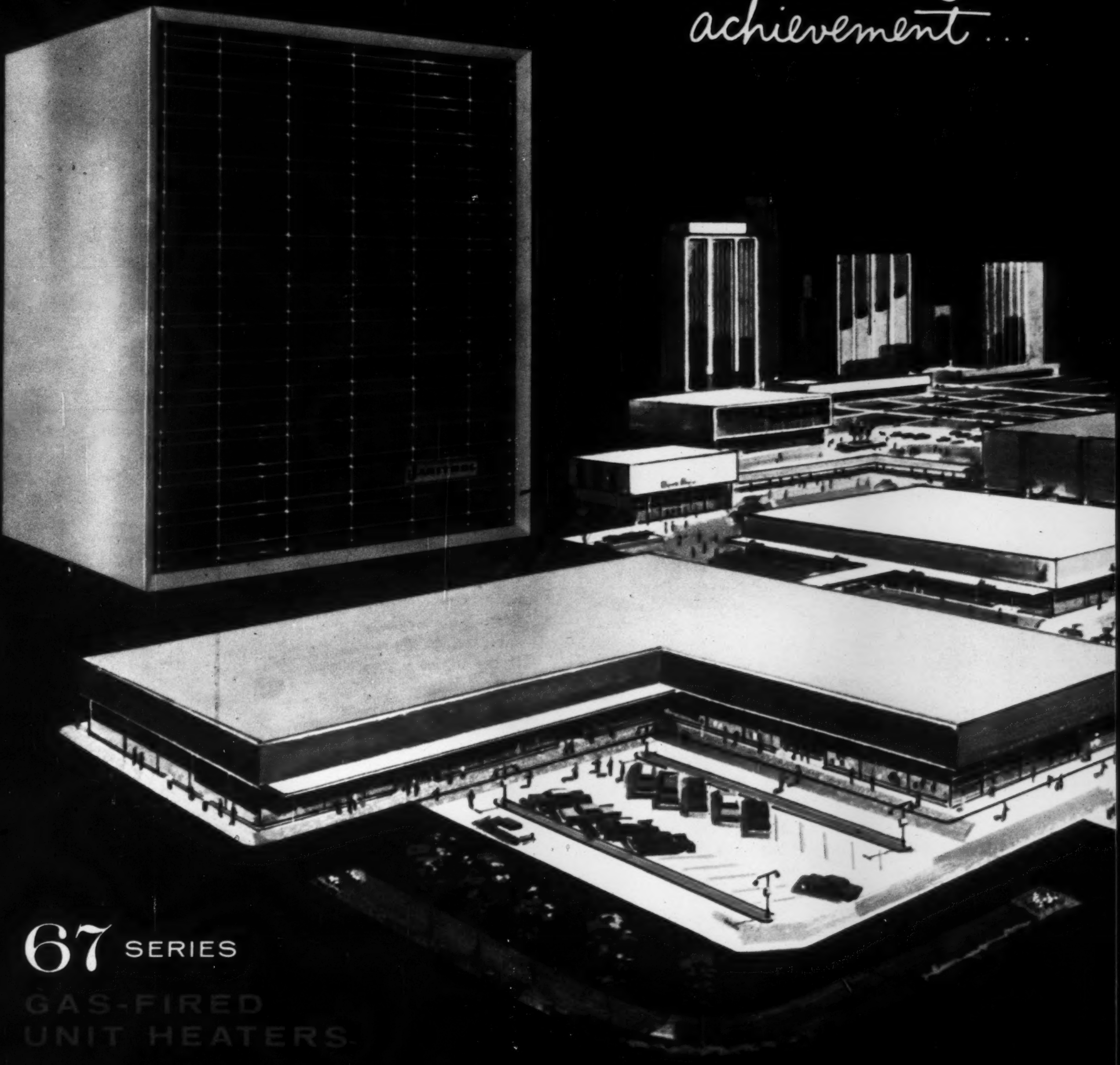
. . . to be used with standard female end—*Weatherhead Co., 128 W. Washington Blvd., Fort Wayne, Ind.*

Split flange adapter fittings available in straight, 45 and 90 deg elbow styles, each in five standard sizes from 3/4 to 2 in. tube size.

Pipe Fittings . . .

. . . recommended by manufacturer for installations involving problems of corrosion, pressure, and temperature—*Cajon Machine Co., 902 E.*

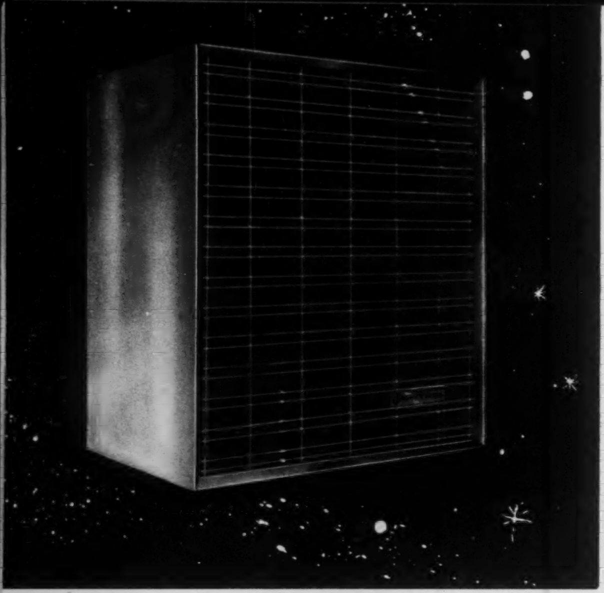
JANITROL *presents a dramatically new achievement...*



67 SERIES

GAS-FIRED UNIT HEATERS

UNPRECEDENTED STYLING, PERFORMANCE AND DURABILITY TO MEET THE MODERN TREND IN ARCHITECTURAL DESIGN



provide the ultimate in quality and economy

new JANITROL GAS-FIRED

commercial & industrial heating equipment

ALL NEW! JANITROL 67 SERIES UNIT HEATERS FEATURING. . . STELLAR NEW STYLING, PERFORMANCE AND DURABILITY!

FEATURES THAT MAKE ALL OTHER UNIT HEATERS OLD-FASHIONED!

New "sheer look" styling—Beautiful Phoenix Beige finish • New gold-tone grille. Conceals louvers and draft hood opening • Low overall height • Automatic controls—Fully accessible • Factory-fired • Low Voltage Gas Controls—Standard • Low Voltage Sensitive Thermostat—Standard • Limit control—interrupts control circuits and shuts off fuel if unit temperature becomes excessive • Thermopilot Shut-off. Shuts off all gas, including pilot, in event of pilot flame failure • Automatic Pilot. Exclusive Janitrol low Btu. non-linting design • Quiet air delivery. Acceptable for schools and other applications where conventional units are too noisy • Motor prelubricated for 5 years • Built-in Draft Hood. Removable, provides full access to heat exchanger. Protects burners from abnormal up or down draft • Combustion air inlet. At bottom rear, through control enclosure. Controls constantly cooled by combustion air stream. Eliminates cross draft on burners • Ampli-Fire Ribbon Flame Burners. No flame contact on metal. Removable, with non-linting air shutters featuring thumb-screw adjustment.

New Janitrol 67 Series Unit Heaters are unusually handsome . . . incredibly quiet and efficient. They bring you, for the first time in unit heater history, distinctive appearance you can recommend for the smartest business setting. And they offer in even greater measure the traditional Janitrol quality and dependability in heating.

Their clean, crisp "look" is a departure from the crude, cumbersome industrial appearance of yesterday. Modern machine tools, trucks and structures have evolved as attractive, functional designs. And now, Janitrol sets the pace in unit heater styling!

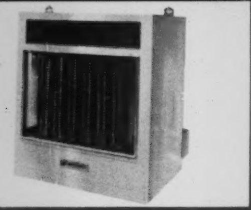
The draft hood opening and adjustable louvers are concealed by the beautifully styled gold-tone grille. The rear combustion air inlet permits use of a solid bottom panel . . . eliminates any possibility of obstruction to combustion air intake.

Inside, design progress is equally significant. Yet every part is proven . . . every safety feature is included. Result? Performance no other unit heater can duplicate.

Naturally, the "heating heart" of every new Janitrol is the famous Janitrol Multi-Thermex heat exchanger with this unchallenged record for durability and low maintenance: among nearly three million heat exchanger tubes produced since 1940, replacements for all causes have run less than ¼ of 1%.

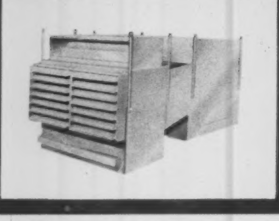
Investigate the many exclusive advantages of Janitrol 67 Series Unit Heaters for jobs you specify or install. Let them help build your reputation for quality.

MEET EVERY COMMERCIAL AND INDUSTRIAL HEATING NEED FROM JANITROL'S BROAD LINE



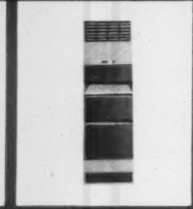
GAS-FIRED DUCT-FURNACES

Install in a duct where air is circulated by separate blower. Adaptable for use with cooling. Two sizes: 200,000 and 300,000 Btu/hr. input—may be combined to provide capacity from 200,000 Btu/hr. up, in increments of 100,000 Btu/hr. input. Six sizes, from 50,000 to 225,000 Btu/hr. in Duct 55 models.



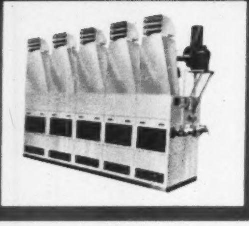
BLOWER-TYPE UNIT HEATER

Allows air delivery from greater heights and against greater static pressures. Models with exposed or enclosed blowers. A.G.A. approved as low and high static-type blower unit heater for air delivery to duct system up to 1.0 in. W.C. external static. Heat sections factory assembled. Sizes: 300,000, 400,000 and 500,000 Btu/hr. input.



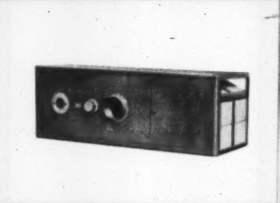
FLOOR-TYPE UNIT HEATER

Cold air drawn from floor level is heated, filtered and discharged horizontally overhead. Quiet, clean, carefree —ideal for offices, restaurants, stores, labs, etc., requiring a compact unit.



HEAVY DUTY BLOWER HEATERS

For unit heating, central heating and air conditioning. Wide range of standard blowers and motors assures correct air delivery and temperature rise in each application. Factory assembled and tested. Capacities from 250,000 Btu to 1,750,000 Btu/hr. input.



HORIZONTAL OIL UNIT HEATER

For suspension overhead. Saves floor space. Compact, efficient, low-maintenance design clean and quiet in operation. May also be used to feed duct system. Choice of sizes from 84,000 to 250,000 Btu/hr. output to meet all needs.

helpful data for

ARCHITECTS, CONTRACTORS AND ENGINEERS

write collect today for complete information on Janitrol units for heating with clean, economical gas in buildings of every type. There's no obligation.

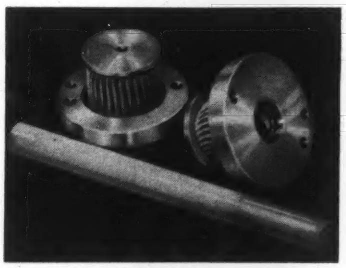
JANITROL
HEATING AND AIR CONDITIONING
A Division of Midland-Ross Corporation
Columbus 16, Ohio • In Canada: Moffats Ltd., Toronto 15

Also Makers of Surface Industrial Furnaces, Kathabar Humidity Conditioning, Janitrol Residential Heating and Cooling Equipment.

EQUIPMENT DEVELOPMENTS
Continued

140th St., Cleveland 10, *O.*

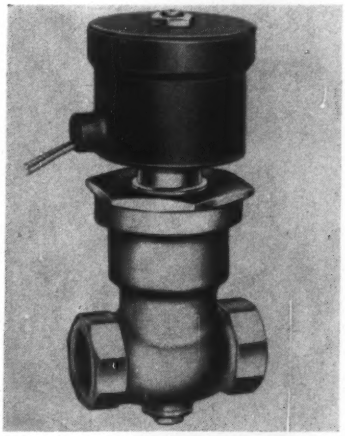
Fittings available in any machinable metal or plastic in sizes 1/16 through 1 in.



Pipe Line Filter . . .

. . .with relief valve—*Aircraft Porous Media, Inc., Pall Corp., Glen Cove, N. Y.*

Unit is rated at 2 microns and 15 microns absolute; designed to operate at 0.3 gpm under normal conditions and 0.8 gpm under intermittent conditions; has temperature range of —65 F to 275 F; relief valve cracking pressure is + 15 psi at 150 F.



Solenoid Valve . . .

. . .in bronze or stainless steel—*Atkomatic Valve Co., Inc.,* 545 *W. Abbott, Indianapolis, Ind.*

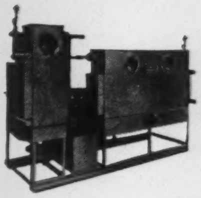
Valve has port sizes $\frac{1}{2}$ to 3 in. and capacity from 0 to 3000 psi; bulletin "S-1" contains complete description, specifications, application data.

Control Valves . . .

. . .rated for 150 psi steam and 300 psi liquids and gases—*George W.*

KATHABAR® SYSTEMS

Give these advantages to specifying engineers:



STERILE AIR

Now you can design spaces to maintain air sterility as scientifically as temperature and humidity. Only Kathabar enables you to deliver air at 5 microorganisms per 10 cu. ft. or less, continuously.

FROST-FREE COOLING

Get continuous air supply at dry bulbs and dew points way down to −90 F.
No freeze-ups...
no fluctuating efficiency...
no defrosting shutdowns...
no duplicate sets of coils.
Cool better; fewer tons.
Proved in candy cooling...
photo film chilling...brewing...
chemical processing...
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many other applications.

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A Division of Midland-Ross Corporation
Send facts on Kathabar systems for following application:
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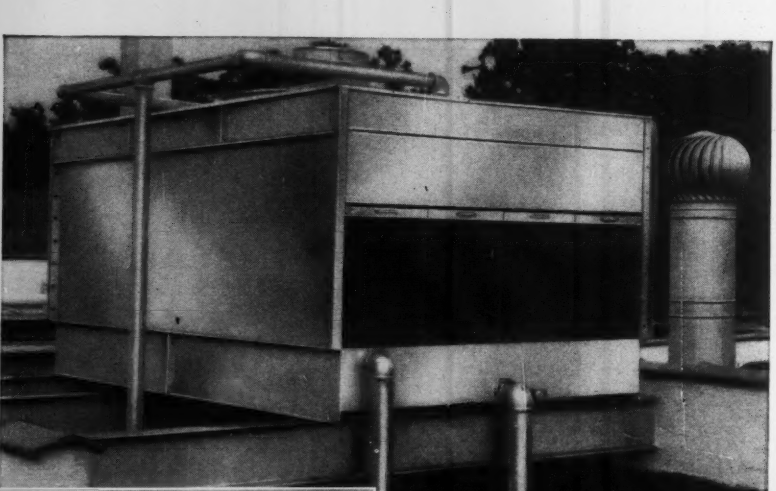
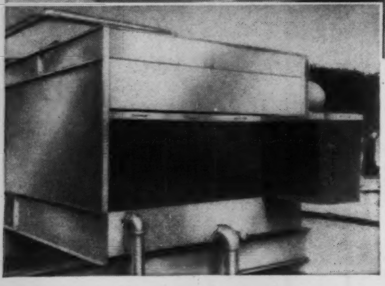


Above: Condenser cooling water, for steam treating equipment used in milk-flavor control, is dropped from 100° F to 80° F in this 50-ton Binks Watertemp® cooling tower.



Left: Plastic decking packages slide out for easy cleaning maintenance.

AT BORNHOFF DAIRY...

New cooling tower design makes maintenance easy

"In a dairy, all processing equipment must be spotlessly maintained," reports Mr. Harvey Bornhoff, partner of Bornhoff Dairy, Inc., Glenview, Illinois. "That is why we like our Binks Watertemp® cooling tower. In addition to doing an efficient job of cooling condenser water under all weather conditions, the tower is a snap to maintain and clean."

No spray nozzles to clean

"Water just comes in at the top of the tower. It spreads out over a distribution pan, that has holes in it, and starts down through the tower."

Slide-out plastic decking

"The multi-finned plastic decking slides right out of the tower in easy to handle packages. Hosing down and clean-up can be thorough. With decking out, we also have complete inside access to the tower."

Needs no paint

"We won't have to paint the tower either. All parts were hot-dipped galvanized after fabrication to make them completely weatherproof."

Free specification details

Send for Bulletin WT 501. Contains the details you need to specify big tower performance that has low bid potential. Get a copy from your nearest Binks Branch Office or write direct.

Binks
EVERYTHING FOR WATER COOLING

A COMPLETE LINE OF NATURAL DRAFT AND MECHANICAL DRAFT COOLING TOWERS AND INDUSTRIAL SPRAY NOZZLES

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3118-38 W. Carroll Ave., Chicago 12, Ill.

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EQUIPMENT DEVELOPMENTS

Continued

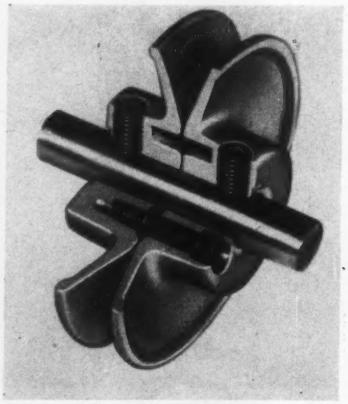
Dahl Co., Inc., 86 *Tupelo St., Bristol, R.I.*

Available in three models; valves are compact, diaphragm-operated, on-off type with bronze bodies.

Pressure Gage . . .

. . . to determine differential pressure of air and other gases—*Hastings-Raydist, Inc., Hampton, Va.*

Instruments have full scale range from 0 to 0.01 in. water gage; other models from 0 to 0.03, 0.1, 1.0, 3, 10, 20, 50, 100 in. WG; can be calibrated directly in terms of mass flow or used as remote recorders.



Variable Pitch Pulley . . .

. . . with micrometer adjustment to set pitch to desired rpm required on driven pulley—*Congress Drives Div., Tann Corp.,* 3750 *E. Outer Drive., Detroit* 34, *Mich.*

May be used with 3/8, 1/2, 5/8 in. top width V-belts; adjustment is made by turning socket cap screw on end of hub after loosening one half of variable pulley from shaft; adjusting half moves parallel with shaft.

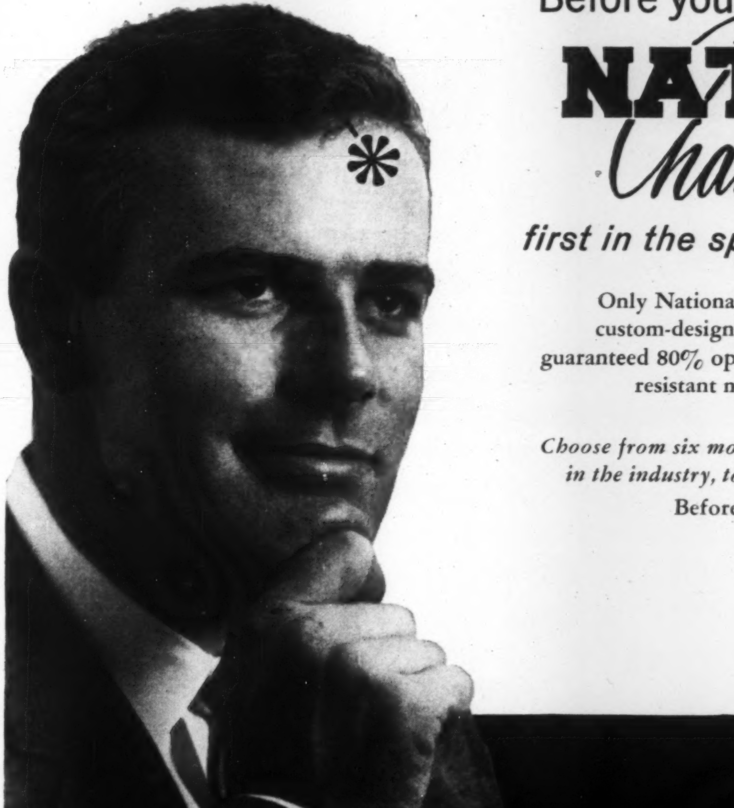
BE CONFIDENT

that your decision on space heating is Right!!

Before you select, check with...

NATIONAL *Champion*

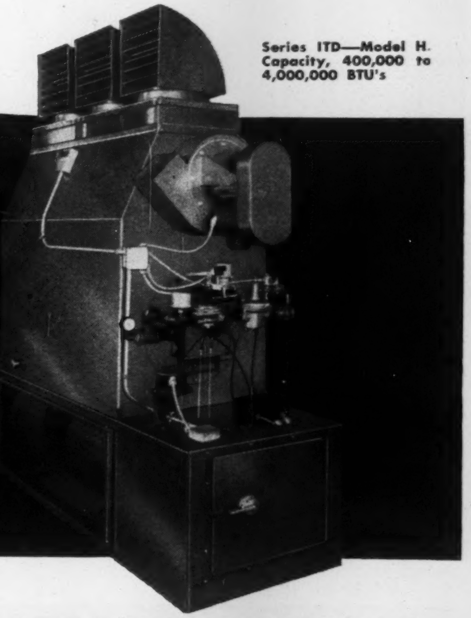
first in the space heating industry



Only National "Universal" heaters give you exclusive custom-designed or conventional packaged heaters . . . guaranteed 80% operating efficiency . . . heat and corrosion resistant metals throughout all units . . . gas, oil or combination fuel burners.

Choose from six models and 96 sizes — the largest selection in the industry, to fit EVERY space heating requirement!

Before you select — check National! You owe it to *yourself* and the company you represent, to make the *right* decision.



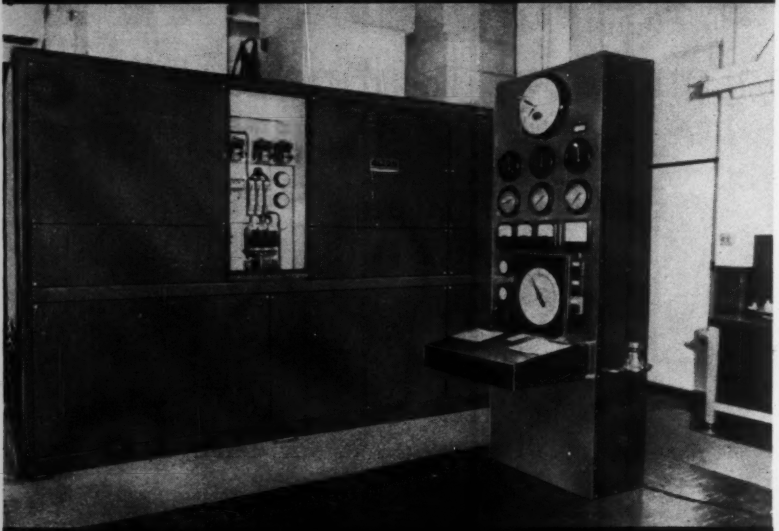
Series ITD—Model H.
Capacity, 400,000 to 4,000,000 BTU's

***Select with confidence!**

For information on the full line of National Champion heaters call or write—

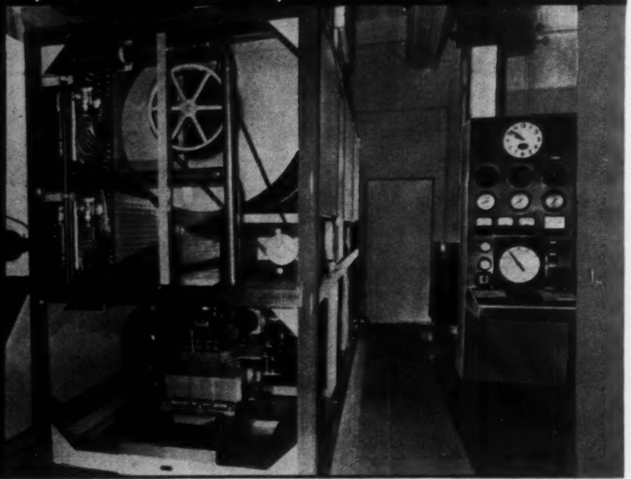
NATIONAL HEATER COMPANY, INC.
2475 DOSWELL AVE., ST. PAUL 8, MINN., TELEPHONE: MIDWAY 6-9631

Our Policy for over 15 Years
Each **ALTON** Refrigerated Air Conditioning Unit
Gets a 24 hour running test in the specially
constructed TEST ROOM!



Pictured
ALTON'S 50 TON UNIT ... *Packaged complete with Evaporative Condenser*

15
20
25
30
40
50
TON
MODELS



At the Southwest Heating and Air Conditioning Exposition

see it at
BOOTH 403

Write for Information

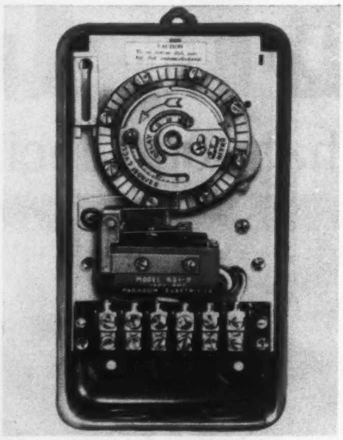
A few of the long time ALTON users are:

SEARS, ROEBUCK & CO.
McCRORY STORES CORP.
SAFEWAY STORES
LEVINE'S DEPT. STORES
TOM THUMB SUPER MARKETS
PERRY BROS. STORES

ALTON *Manufacturing Company*
1112 ROSS AVENUE • DALLAS 1, TEXAS

EQUIPMENT DEVELOPMENTS

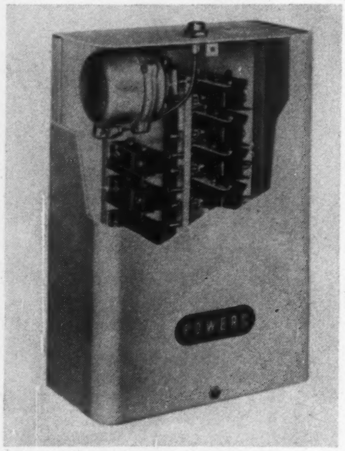
Continued



Coil Defrost Timer . . .

. . . for application to electric heat and compressor shut-down defrosting —*Paragon Electric Co.,* 1609 *Twelfth St., Two Rivers, Wisc.*

May be set to defrost at pre-determined intervals and will break circuit to compressor and energize heater circuit; control also available for defrosting systems that requires fan delay or drain period at end of defrost cycle adjustable from 3 to 45 min in 3 min graduations; bulletins "5945" and "5949" describing both controls available on request.



Step Control . . .

. . . for electric heat unit ventilators, fan systems, pumps, refrigeration equipment—*Powers Regulator Co.,* 3434 *Oakton St., Skokie, Ill.*

Normal pneumatic supply pressure is 15 psi; maximum supply pressure is 25 psi; maximum ambient temper-

The MARSH way is the SURE way–

You'll have a new conception of how *uniformly good* radiator valves, traps and vents can perform when you make the job Marsh all the way through.

Take the Radiator Valve and Trap illustrated here, for instance:

The Marsh Radiator Valve is *truly* packless—not just *called* packless. This valve has no "packing" whatever... instead, the ingenious Marsh annular mechanical seal that keeps it drip tight throughout its far longer life.

And Marsh Radiator Traps are equally sure-footed... have the famous Marsh Diaphragm—extremely rugged, but so sensitive that it never fails to close tight on steam, yet opens instantly to pass condensate and air at only a few degrees below closing temperature.

Yes, the Marsh way is the sure way... Valves, Traps, Vents, F & T Traps, designed, built and tested to give lasting satisfaction in the Marsh tradition. Ask for up-to-date Heating Specialties Catalog 76-H.

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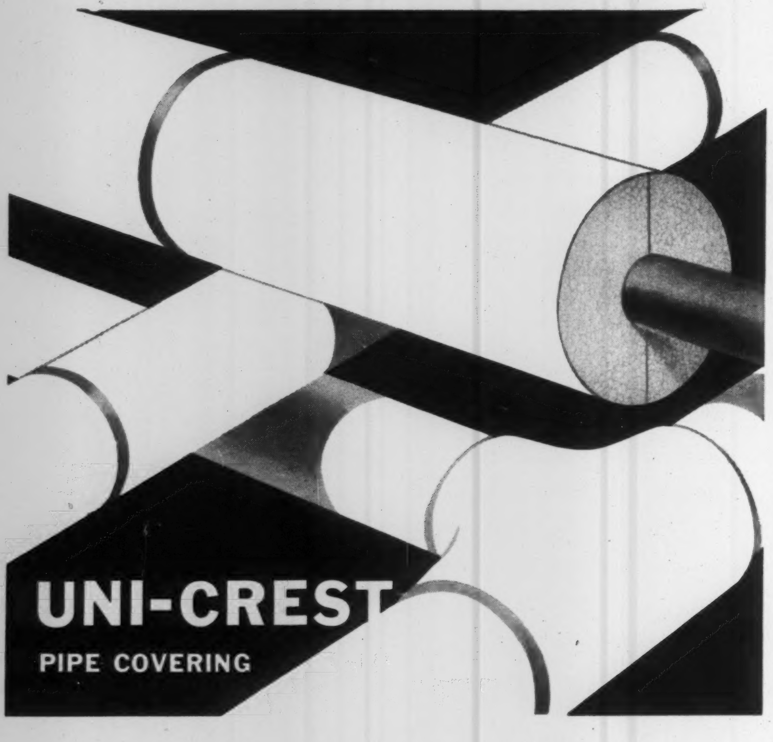
Division of Colorado Oil and Gas Corporation
Dept. T, Skokie, Illinois
Marsh Instrument & Valve Co., (Canada) Ltd.
8407 103rd St., Edmonton, Alberta, Canada

MARSH *Heating Specialties*
SINCE 1865



a new, economical, low temperature insulation

Uni-Crest expanded polystyrene pipe covering is an excellent low temperature insulating material, and is inexpensive to install and maintain.

Its low thermal conductivity (K factor) plus its high resistance to water and water vapor — are some of its prime qualities. It will not rot, mildew, or support fungus growth.

Extremely lightweight, with a smooth, tough white surface, Uni-Crest is non-dusting, non-flaking, and easily cut and handled on the job.

Uni-Crest and self-extinguishing Uni-Crest are available in a wide variety of sizes and shapes. Both types are also available with or without a paper and foil laminate jacket.

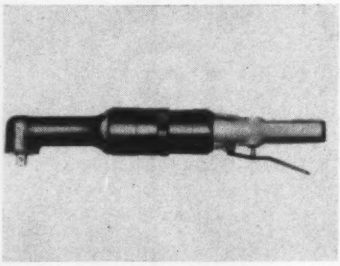
For the address of the office nearest you, plus additional information and an actual sample, please write to the address below.

UNI-CREST DIVISION UNITED CORK COMPANIES
Since 1907

UNITED'S UNI-CREST EXPANDED POLYSTYRENE
1 Central Avenue, Kearny, New Jersey

BRANCH OFFICES OR APPROVED DISTRIBUTORS IN ALL KEY CITIES

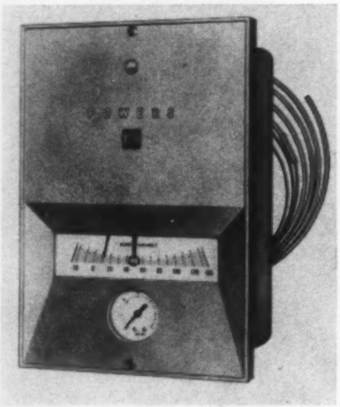
ature is 160 F; additional information in form "P-80" available on request.



Pneumatic Wrench . . .

. . .facilitating nutrunning under power in difficult access areas—*Buckeye Tools Corp.*, 5003 *Springboro Pike, Dayton* 1, *O.*

Wrenches are non-reversible 90 deg angle of stall-type with ½ sq in. drive spindle; offered in three models of 500 to 1000 rpm; bolt sizes range from 7/16 to 9/16 in. with torque outputs of 30 to 63 ft-lb; have head diam of 1¾ in. and height of 2 in.



Temperature Regulators

. . .for control of remotely readjusted temperatures in heating, air conditioning, industrial processes—*Powers Regulator Co.*, 3434 *Oakton St., Skokie, Ill.*

Regulator has throttling range adjustment of 0 to 35 percent; device is pneumatically operated temperature controller, whose control point is reset by master controller or posi-

KORFUND FLEX-HOSE
KORFUND
RUBBER
FLEXIBLE METAL

NEW FLEX-HOSE

NEWEST MEMBER OF THE KORFUND VIBRATION AND NOISE CONTROL TEAM

Now you can get complete top-to-bottom vibration and noise control from Korfund. With the addition of Korfund Flex-Hose (available in both flexible metal or rubber), our line is complete. Now you can get really smooth operation from pumps, compressors and refrigeration machines by connecting both suction and discharge lines to new Flex-Hose in order to stop transmission of vibration and noise through the rigid piping; and, by mounting the equipment on Korfund Vibro-Isolators to stop transmission through the floors and structure.

We've always recommended using flexible connectors in conjunction with our isolation mounts for efficient operation. Now we can offer you what we consider to be the best available — Flex-Hose. These quality products were designed and approved by Korfund engineers—specialists in vibration and noise control for more than a half-century.

Korfund Metal Flex-Hose is available in corrugated, seamless bronze, carbon steel, stainless steel, or monel tubing in fourteen pipe sizes from ¼" I.D. to 16" I.D. The tubing is protected and reinforced by a new unique braid providing especially high burst strengths. Maximum steady working pressures vary with size up to 1700 psi, and may be increased by as much as 75% by added braiding. Flex-Hose comes in your choice of five standard end fittings.

Korfund Rubber Flex-Hose consists of an inner rubber tube protected by a wire reinforced carcass and outer wrap. It is available in fifteen pipe sizes from ½" I.D. to 12" I.D. Fittings are either male threaded hex ends, or full faced integral built-in rubber flanges. Rated working pressures are 150 psi and 250 psi depending on job requirements.

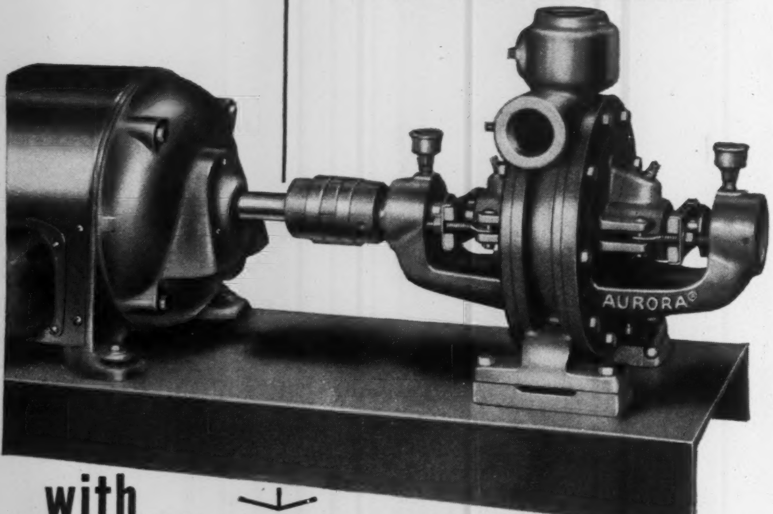
Korfund Flex-Hose is shipped with a written one-year warranty and instructions. Find out more about it. Write for Bulletin 61.

For specific recommendations contact us or one of the 46 local Korfund offices. Look under "Korfund" in your local Telephone Directory or in Thomas' Register.

KORFUND

THE KORFUND COMPANY, INC.
VIBRATION • SHOCK • NOISE: CONTROL & MEASUREMENT
48-OIF THIRTY-SECOND PLACE • LONG ISLAND CITY 1, NEW YORK

Profit by... CONTROLLED PERFORMANCE



with... TURBINE TYPE APCO PUMPS

- PROVEN DEPENDABILITY
- CALCULATED CAPACITIES
- RUGGED CONSTRUCTION
- HIGHEST QUALITY CONTROL
- APPLICATION ANALYSIS
- SELECTED COMPONENTS
- MINIMIZED WEAR
- SERVICE FLEXIBILITY
- PRESSURES TO 400 P.S.I.
- CAPACITIES TO 150 G.P.M.

Ruggedness of construction and simplicity of design of APCO turbine type pumps combine to provide longer life, high efficiency, and minimized down time. This means more for your "pump operating dollar." With APCO *steep impeller* characteristics there is little capacity change under fluctuating head conditions. Select from the "1001" types, sizes, and capacities of AURORA pumps to obtain *the one* specifically designed to fit your needs.

APCO turbine type pumps are most frequently used for: Boiler Feed, Condensate Return, Fresh Water Service, Brine Service, Ice Water Circulation, Filter Service, LPG Service, Transfer Service, Caustic Liquid Handling, Sprinkler Service, Spraying Service, Water Treatment, Booster Service, and High Temperature Service.

WRITE TODAY FOR NEW BULLETIN S-111

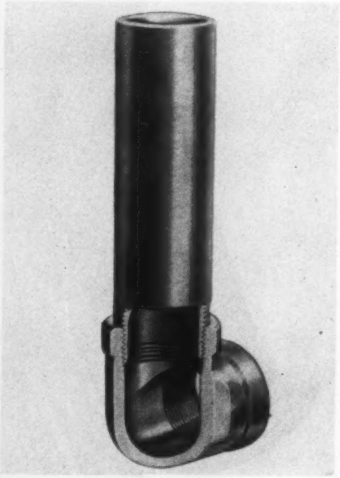
AURORA *Always* PUMPS

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
650 LOUCKS STREET • AURORA • ILLINOIS

LOCAL DISTRIBUTOR IS LISTED IN THE YELLOW PAGES OF YOUR PHONE BOOK

EQUIPMENT DEVELOPMENTS
Continued

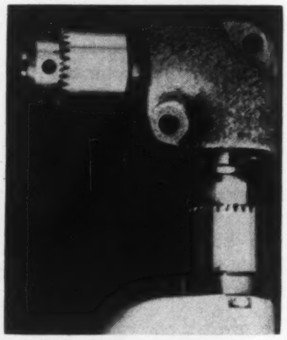
ioning switch; full information in form "P-73" available on request.



Pipe Fittings . . .

. . . for use with hydraulic fluids, air, water—*Weatherhead Co., 128 W. Washington Blvd., Fort Wayne, Ind.*

Constructed of forged steel and ball drilled; test pressures are 15,000 psi for diameters up to 1 in. and 10,000 psi for sizes over 1 in.



Angle Drill . . .

. . . for use by contractors when drilling in limited working space—*Price & Rutzebeck, Post Office Box 30, Hayward, Calif.*

Design features bearing structure in which ball races are ground in end of hardened gears; allows transmission in 1 to 1 ratio of 1 1/3 hp at 3000 rpm, or 1/3 hp at 750 rpm, and maximum allowable speed of 6000 rpm.

422 Reasons Why...

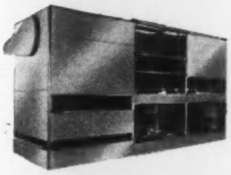
YOU CAN "DESIGN" YOUR OWN AIR CONDITIONING AT . . Governair

"©SATISFABRICATED" TO SUIT YOUR REQUIREMENTS

Self-Contained Unit
With Evap. Condenser Type SCU

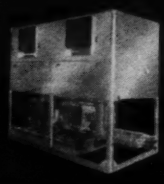
From 11 Basic Models
30 Possible Combinations

Self-Contained Unit
Multi-Zone Type SCMZ



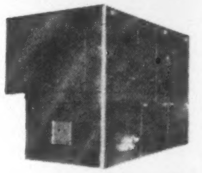
From 11 Basic Models
50 Possible Combinations

Self-Contained Unit
Shell and Tube Type ST



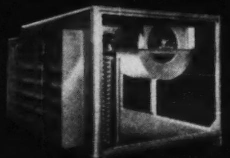
From 13 Basic Models
25 Possible Combinations

Self-Contained Unit
Multi-Zone Type STMZ



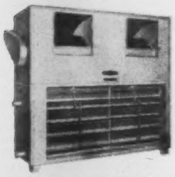
From 13 Basic Models
25 Possible Combinations

Horizontal Air Conditioner
Type GHC



From 14 Basic Models
56 Possible Combinations

Vertical Air Conditioner
Type GVC



From 14 Basic Models
56 Possible Combinations

Multi-Zone Air Conditioner
Type GMZ

From 14 Basic Models
84 Possible Combinations

Evaporative Condensers
Type EC

From 14 Basic Models
28 Possible Combinations

*ChillPak Water Chiller
Type CPS

From 10 Basic Models
68 Possible Combinations

*Cabinet models available with built-in or remote evaporative condenser.

ORIGINATORS AND DEVELOPERS OF COMPLETELY PACKAGED AIR CONDITIONERS

NATIONAL REPRESENTATION IN PRINCIPAL CITIES. SEE YOUR LOCAL YELLOW PAGE PHONE DIRECTORY.

GOVERNAIR

WRITE FOR FURTHER INFORMATION ON ANY SPECIFIC UNIT, OR SEE OUR LISTING IN ASHACE "GUIDE."

4840 N. SEWELL • OKLAHOMA CITY, OKLAHOMA

EVERY ENGINEER will want these FACTS!

NEW EDITION
Bulletin No. 31-A

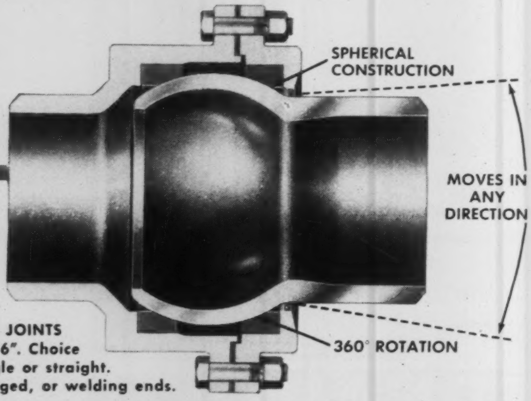
Other Types of Thermal Expansion Piping Problems Economically Solved by Barco Ball Joints
Space-Saving Expansion Loops Made With Ball Joint Fittings
How to Solve Piping Flexibility Problems
BARCO BALL JOINTS
THERMAL EXPANSION AND CONTRACTION

"HOW TO SOLVE
PIPE EXPANSION
PROBLEMS"

TODAY there is an easier way to accommodate *thermal expansion* in piping! No need to install special devices—in virtually every instance, you can put *flexibility* right in the line itself with standard BARCO BALL JOINTS:

1. **SUPERIOR METHOD.** New Steam Power Stations . . . Oil Refineries . . . Chemical Plants . . . Paper Mills . . . Office Buildings . . . Schools now are using this money-saving method.
2. **LONG LIFE.** No rubber, no thin metal members subject to fatigue or "blow-out." No lubrication, no grease packing. Self-adjusting; pressure sealing.
3. **FIRE-SAFE.** The joints have passed rigid fire, high temperature, and water quench tests.
4. **SAVE SPACE, CUT COSTS.** No pressure thrust — expensive anchoring or bracing not required to hold piping in place or in line. Cuts space required for pipe loops and U-bends.
5. **VERSATILE.** Easy to handle compound twisting movements, wide variations in temperature and pressure—steam, air, oil, water, gas and chemicals.

SEE your Barco Representative for information or write. Ask for the new revised Bulletin No. 31-A, "How to Solve Piping Flexibility Problems." *Engineering recommendations on request.*


SPHERICAL CONSTRUCTION
MOVES IN ANY DIRECTION
360° ROTATION

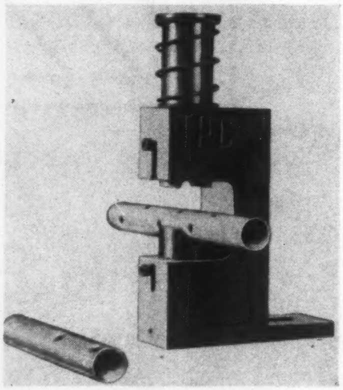
BARCO BALL JOINTS
Sizes ½" to 16". Choice
of styles, angle or straight.
Screwed, flanged, or welding ends.

PRODUCTS BACKED BY EXPERIENCE
BARCO
FOUNDED 1908

BARCO MANUFACTURING CO.
5418 Hough Street • Barrington, Illinois

The Only Truly Complete Line of Flexible Ball, Swivel, Swing and Revolving Joints
In Canada: The Holden Co., Ltd., Montreal

EQUIPMENT DEVELOPMENTS
Continued

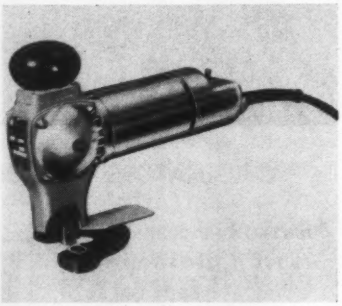


Tube Perforator . . .
. . . with ability to perforate one or two opposed holes with one stroke of press—*Tool Products Corp., 377 Old Falls Blvd., North Tonawanda, N.Y.*

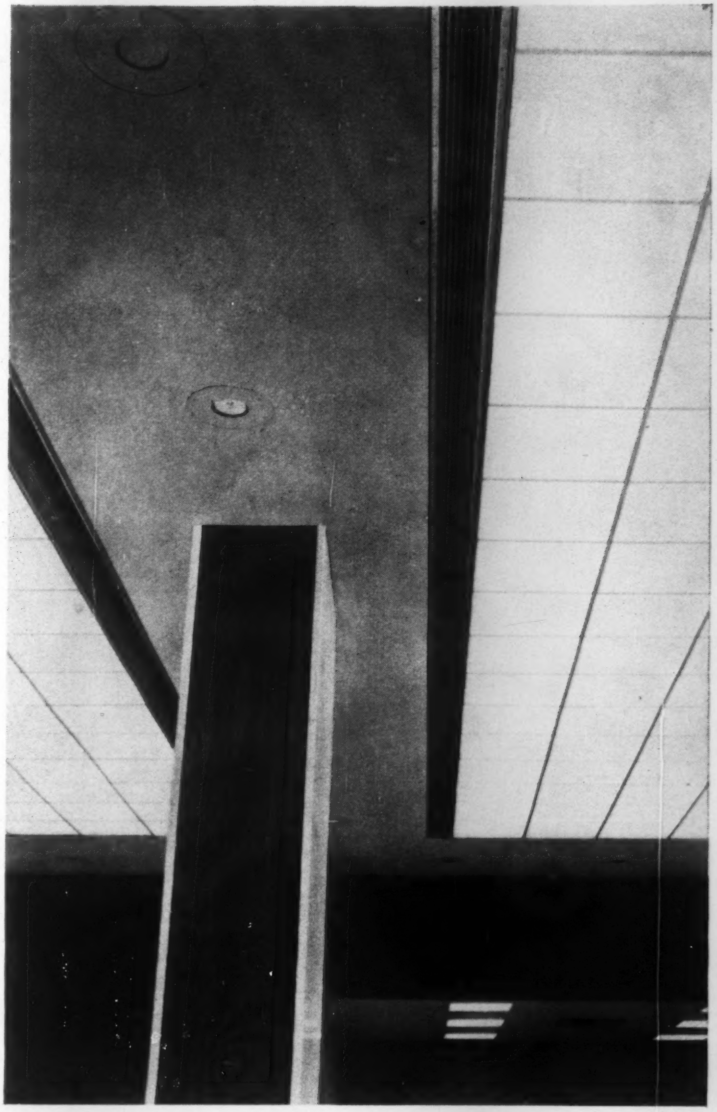
Multiple punching of tube can be achieved by arranging any number of units on press or press brake.

Scale Preventive . . .
. . . for application to stainless steel, nickel-chrome alloys, cobalt alloys, copper alloys, new exotic alloys—*Navan Products, Inc., Div. of North American Aviation, Inc., International Airport, Los Angeles 45, Calif.*

Coating prevents scale formation on metal during heating.



Electric Shear . . .
. . . that will cut through 30 ft per min of No. 18 gage cold-rolled steel



Draftless ANEMOSTAT® Air Diffusers *at* BANKERS TRUST COMPANY

DESIGNER for the Bank: Henry Dreyfuss • **ARCHITECTS** for the Bank: Shreve, Lamb and Harmon Associates • **CONTRACTOR** for the building and the Bank: Diesel Construction, Inc. • **MECHANICAL ENGINEERS** for the Bank: Meyer, Strong and Jones • **SUB-CONTRACTORS**: Raisler Corporation

In the new offices of the Bankers Trust Company at 529 Fifth Avenue, New York, customers and employees enjoy complete air conditioned comfort with Anemostat Air Diffusers. In the banking area, over 1500 feet of Anemostat Straight Line Air Diffusers draftlessly distribute the conditioned air.

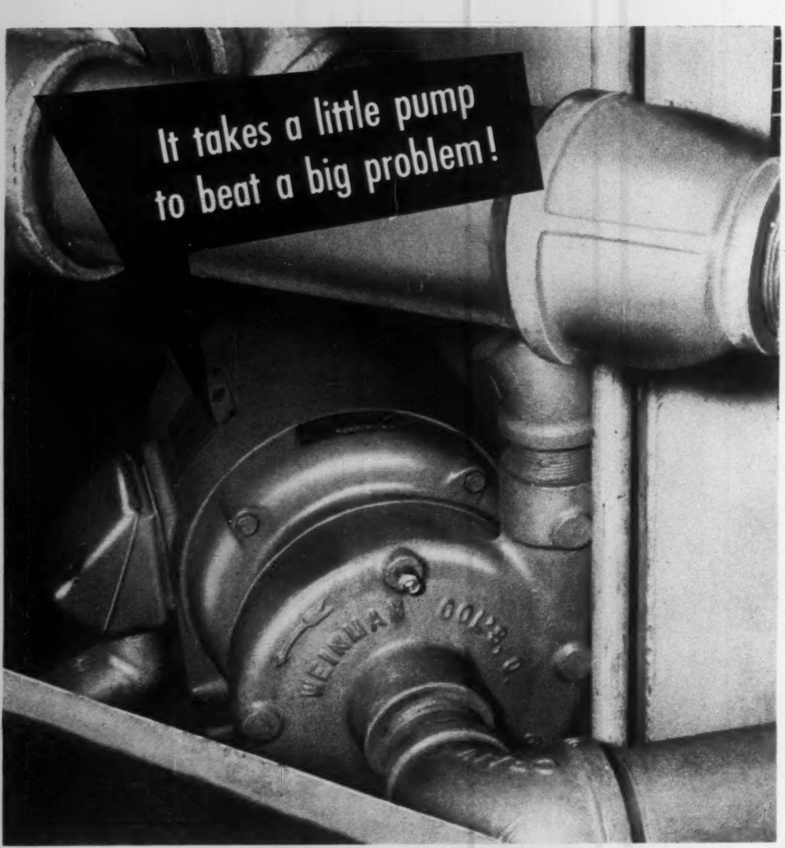
Write for ANEMOSTAT Selection Manual 60 containing data on wide-range ANEMOSTAT line.

ANEMOSTAT®

DRAFTLESS *Aspirating* **AIR DIFFUSERS**

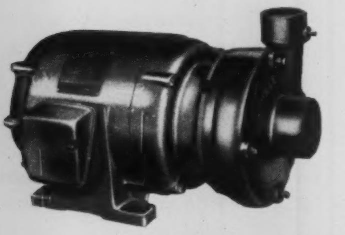
ANEMOSTAT CORPORATION OF AMERICA
10 East 39th Street, New York 16, N. Y.
Representatives in Principal Cities

1376



Compact WEINMAN AC pumps simplify installation of air conditioning systems

Lack of space can be a real problem in air conditioning installations. The best way to lick this difficulty is with Weinman AC air conditioning pumps. These compact, versatile units take up little space, can be mounted in any position and yet operate year after year without failure. One reason — ceramic floating seal seat and synthetic carbon compound sealing washer assure long trouble-free service, leakless operation, even when handling water carrying abrasive dust.



There are over 60 models to choose from. Output ratings up to 260 g.p.m., heads up to 150′, horsepower ratings from ¼ to 7½. See your Weinman centrifugal pump specialist. He's listed in the Yellow Pages. Or, write us direct.

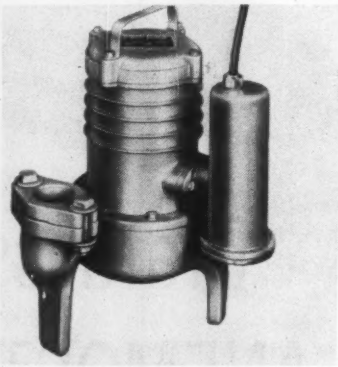
THE **WEINMAN PUMP** MFG. CO.
290 SPRUCE ST. COLUMBUS 8, OHIO
CENTRIFUGAL SPECIALISTS
MEMBER

EQUIPMENT DEVELOPMENTS

Continued

—*Black & Decker Mfg. Co., 628 Pennsylvania Ave., Towson 4, Md.*

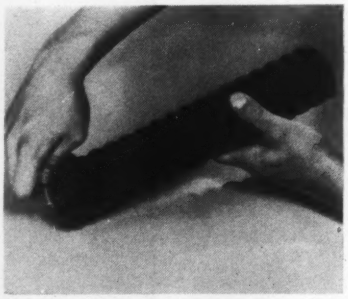
Designed to deliver 2500 cutting strokes per min; will handle monel metal or stainless steel in thicknesses up to 20 gage.



Waste Ejector . . .

. . . where waste must be pumped up to outside sewer lines—*Weil Pump Co.,* 1530 *N. Fremont St., Chicago* 22.

Capable of handling solids up to 1½ in. diam; capacity is 75 gpm at 15 ft head and 50 gpm at 20 ft head; motor is ½ hp capacitor type with overload protection and permanently sealed ball bearings; bulletin "SE 850" gives full information.



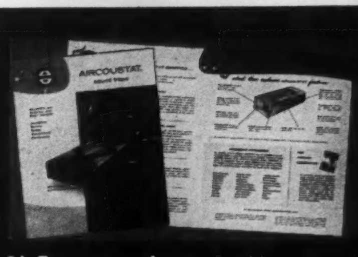
Rubber Hose . . .

. . . for industrial applications where dusts and gases create explosion hazards—*B. F. Goodrich Chemical Co.,* 3135 *Euclid Ave., Cleveland* 15, *O.*

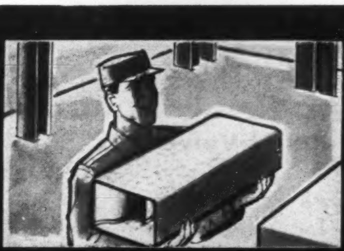
Hose consists of rubber core which is wrapped with continuous coil of 3/16 in. round, rigid vinyl rod; both

7 ways AIRCOUSTAT® can save you time and money

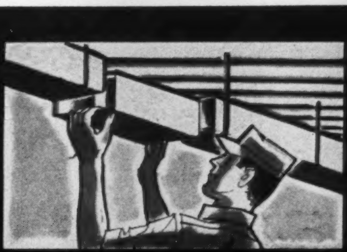
Sound Traps . . . with Guaranteed Results



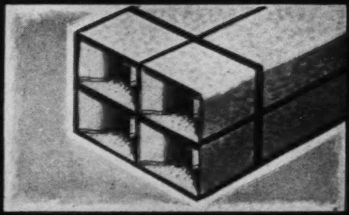
1) Easy to select—Just 3 steps to specify proper model. Save time, avoid errors.



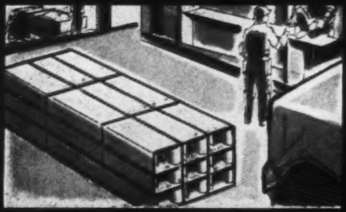
2) Easy to handle—No riggers or special equipment needed. Large units composed at job site.



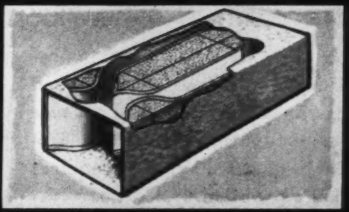
3) Easy to install—Units are installed the same as ductwork. Units have 2" extensions.



4) Fits all duct sizes—Big units are easily assembled from small Aircoustat units.



5) No storage problem—Units are delivered right to the job site, ready to install.



6) No maintenance—Units are fire-resistant, dust-proof and built to last a lifetime.

7) Guaranteed results—Solves every noise reduction problem. Units are completely reliable.

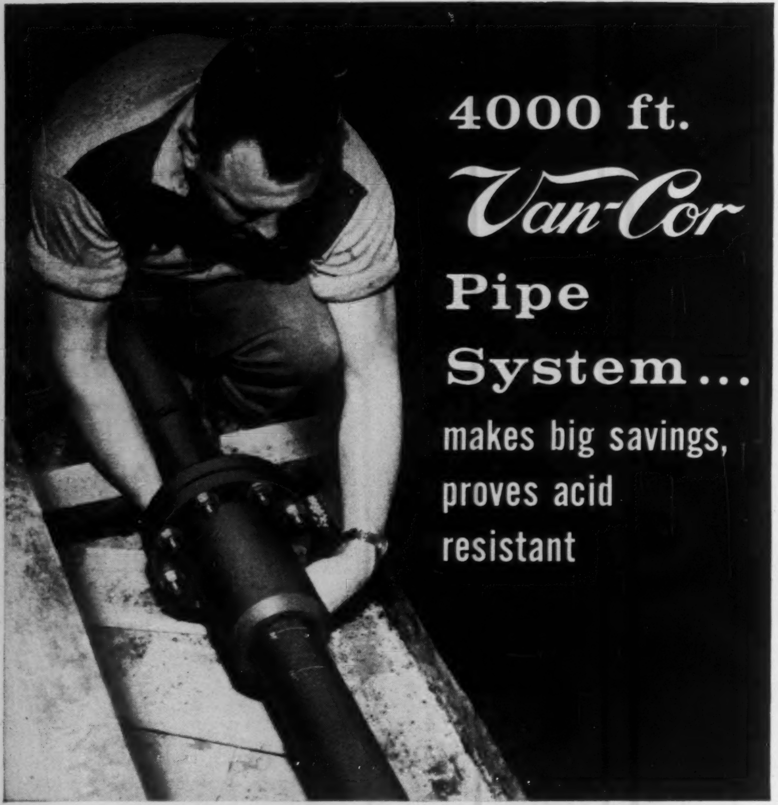
Pre-engineered by Koppers to eliminate guesswork, unnecessary calculations and difficult installations, AIRCOUSTAT Sound Traps guarantee trouble-free silencing of all duct-transmitted noise . . . at a savings in time and money to you.

AIRCOUSTAT selection is quick, simple and reliable. A choice of over 60 stock models, fabricated in 6 lengths, solves every noise reduction problem. AIRCOUSTAT is built to give a lifetime of maintenance-free service.

Write today for your copy of the AIRCOUSTAT Selection Manual, a quick guide to the right unit or combination of AIRCOUSTAT units to eliminate duct-transmitted noise in all air handling systems. Write KOPPERS COMPANY, INC., Sound Control Department, 3401 Scott Street, Baltimore 3, Maryland.

KOPPERS

SOUND CONTROL
METAL PRODUCTS DIVISION
Engineered **Products Sold with** ***Service***



4000 ft. *Van-Cor* Pipe System...

makes big savings, proves acid resistant

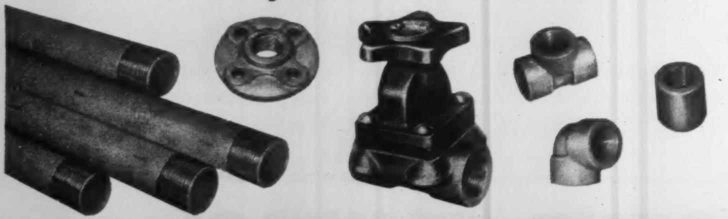
At the Allentown (Pa.) Works of the Western Electric Co., the entire waste acid disposal system in the recent addition consists of Van-Cor rigid PVC pipe and fittings.

HOW COSTS WERE CUT. Initial price of Van-Cor was ⅓ that of comparable cast iron alloy pipe. On a 6″ line, labor costs were estimated at 29¢ per foot of run—about half that of metallic pipe. Also, because Van-Cor has only 1/10 the weight, no mechanized handling equipment was needed. Available in 10 or 20 ft. lengths, Van-Cor requires fewer joints, and eliminates the breakage problem.

CORROSION LICKED. Van-Cor pipe was used because "corrosion resistant" cast metallic pipe had performed short of expectations in an adjacent building. After 1½ years service, the Van-Cor system is in excellent shape, unaffected by such acids as hydrofluoric, hydrochloric, sulphuric, nitric and many plating solutions.

Investigate Van-Cor Pipe, Fittings, Valves, Electrical Conduit, and Fabrications . . .

Write for Catalog and Name of Nearest Distributor



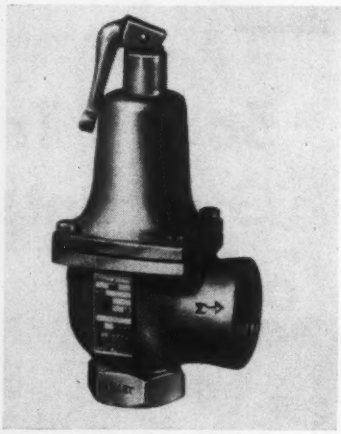
INDUSTRIAL DIVISION OF...

COLONIAL PLASTICS MFG. CO.

Subsidiary of THE VAN DORN IRON WORKS CO.

2685 EAST 79TH STREET CLEVELAND 4, OHIO

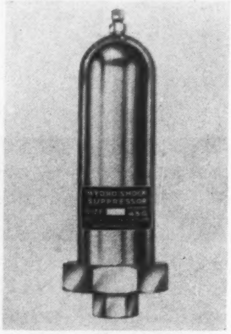
core and coil are then wrapped with exterior layer of abrasion resistant rubber.



Relief Valves . . .

. . .for hot water space heating boilers—*Watts Regulator Co., 10 Embankment Rd., Lawrence, Mass.*

Available in ¾ to 2 in. sizes; has high discharge capacities, large internal flow areas, and expanded outlets.



Water Shock Control . . .

. . .to control water shock in pipe lines—*American Tube Products, Inc., 100 Pulaski St., West Warwick, R.I.*

Control employs hydro-pneumatic principle whereby water shock is absorbed by freely moving piston which works against cushion of compressed air within cylinder; any "hammer" which develops from sudden closing of faucet or valve in pipe line is transmitted to piston and, in turn, to air cushion.

ZONVALVE*

the zone control valve with

100% SHUT OFF

for positive temperature control!

Model C-S, ¾", shown actual size

Globe-type construction of Zonvalve guarantees complete shut-off on steam, hot and chilled water systems. This means positive temperature control, without heat waste.

Engineer-architects and heating men recognize the superiority of Zonvalve's design features. Self-aligning plug insures positive closure and eliminates jamming. Valve is powered by a heavy-duty motor, with pinion, gear and cam assembly—for extra-long life and silent, dependable operation. Zonvalve's "hand-size" compactness makes installation possible where space is limited. Zonvalve is the *only* valve that uses Teflon for a self-lubricating, permanent seal.

Zonvalve is competitively priced. Built to last a lifetime, *it is the only zone control valve with an unconditional written Five-Year Guarantee!*

Zonvalve is ideal for modernization and new construction, in residential, commercial and industrial zone heating. For the finest in zone control equipment—specify Zonvalve, install Zonvalve!

New color brochure contains layouts, applications, customer benefits, technical data and prices. Write for Brochure P-1.

ZONVALVE

* This Trade-Mark is registered by Heat-Timer Corp., manufacturers of heating controls and motorized valves since 1935. It is your guarantee of positive zone control

ZONVALVE MODELS

RS-A C-S S-S

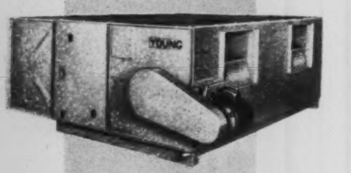
AVAILABLE IN SIZES FROM ½" TO 1¼"

HEAT-TIMER CORP.

657 BROADWAY, NEW YORK 12, N.Y.

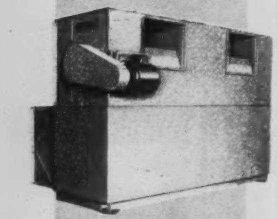
There are 3 Young Central Station Air Conditioning Units from which to Specify

Young CS Units are Easy to Install . . . Easy to Service . . . Economical to Operate



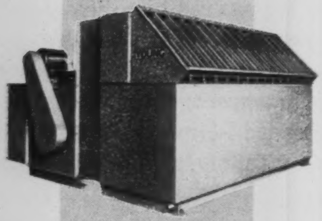
HORIZONTAL UNITS

Young CS Horizontal Air Conditioning Units offer complete flexibility with bolt-on interchangeable designed sections. Available in 10 sizes with capacities ranging from 700 cfm to 28,000 cfm assures "tailor-made" installations for practically any size building.



VERTICAL UNITS

Sectionally-designed Vertical Units are available in the same wide range of sizes and capacities. All types feature easy servicing . . . hinged panels make filters readily accessible . . . special filter removal racks are standard on all Filter Sections and Mixing Boxes for fast, easy removal or inspection of filters.



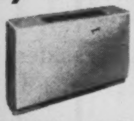
MULTIZONE UNITS

Where independent area control of air conditioning is required from a single unit, Young Multizone Units provide the solution. Nine sizes and a choice of 2 to 21 zones are available. Heating may be provided in one zone while cooling another zone simultaneously.

YOUNG OFFERS A COMPLETE LINE OF EQUIPMENT FOR AIR CONDITIONING ALL TYPES OF BUILDINGS

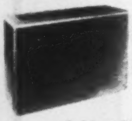
Young Engineers are Pleased to Offer their Services on Any Heat Transfer Problems

Write for FREE Catalogs on any Young Products



Remote Roomaire® Conditioners

Vertiflow® vertical discharge unit heaters



Cabinet Unit Heaters

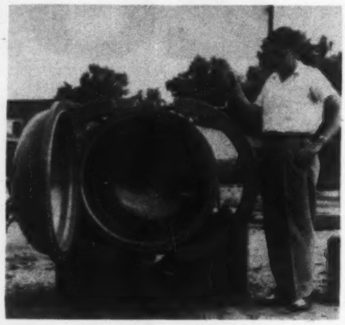
Young ideas for solving heat transfer problems are GOOD IDEAS

YOUNG RADIATOR COMPANY DEPT. A-510 RACINE, WISCONSIN

PLANTS AT RACINE, WISCONSIN AND MATTOON, ILLINOIS

EQUIPMENT DEVELOPMENTS

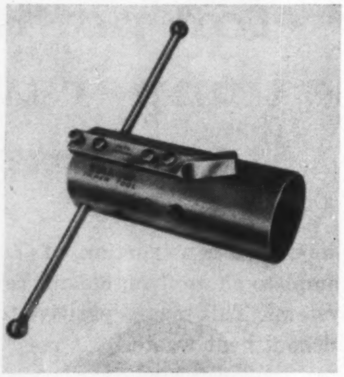
Continued



Hinged Closure . . .

. . .featuring simplicity of design, ease of installation, according to manufacturer—*Tube Turns Div. of Chemetron Corp., 224 E. Broadway, Louisville* 1, *Ky.*

Consists of hub installed with single circumferential weld and hinged cover or cap; hinge is integral part of closure; sizes 8 in. and larger cannot be opened under high pressure.



Fiber Pipe Cutter . . .

. . .to cut tapers on any fiber pipe—*Talon Tools Co., North Arlington, N. J.*

Blade cuts 2 deg taper with built in stop for correct depth; available for 3 or 4 in. pipe; all cutters can be used with ½ in. electric drill.

Seamless Tubing . . .

. . .for heat exchanger pressure tubes and conduction of fluid or gas under pressure—*Texas Instruments Inc., Metals & Controls, 34 Forest St., Attleboro, Mass.*

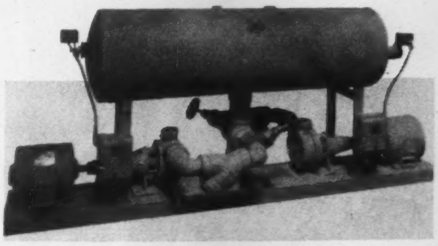
got a liquid transfer problem?

use

EAGAN PUMPS

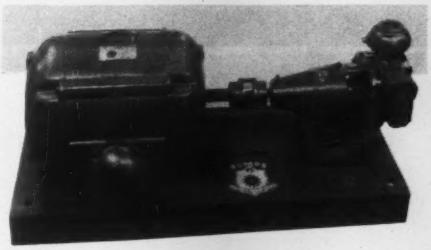
• •

Eagan pumps are a big bargain from a performance, construction and price standpoint. They're designed to meet and exceed your liquid transfer requirements as they do for users throughout many different industries.



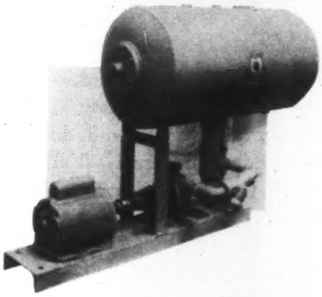
CONDENSATE PUMPS

Capacities up to 100,000 sq. ft. EDR at 200 psi. Five types of units to meet all operational requirements and specifications. They include units with overhead receivers for high temperatures as well as underground receivers for buried returns, steel, cast iron and lined receivers.



TURBINE PUMPS

Made for capacities to 200 gpm. at pressures to 200 psi. in many metals for corrosive chemicals as well as water. Incorporates preloaded bearings to permit positive centering of impeller without lateral bearing play. This permits high speeds without excessive wear.

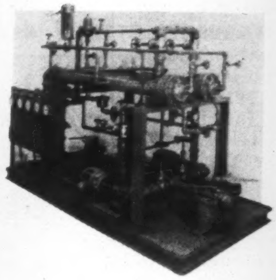


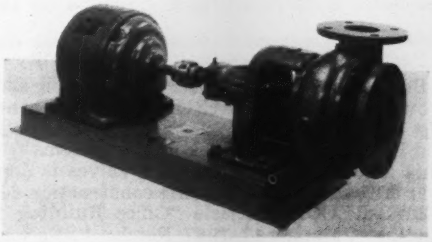
BOILER FEED PUMPS

Packaged units designed to combine the function of boiler feeding and fresh water make-up. High receiver prevents flashing when traps begin to leak. Made in a single and duplex construction for capacities to 100,000 sq. ft. at 200 psi.

FUEL OIL PUMP AND HEATER SETS

For combustion preparation of heavy industrial fuel oil. Packaged units, delivered ready to operate including integral temperature and pressure controls. They heat to 300° F., pump up to 400 psi., have capacities to 3000 gph., are easily installed, serviced.



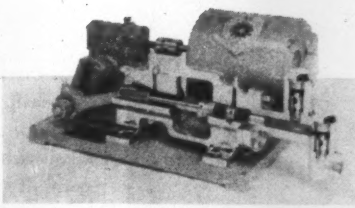


CENTRIFUGAL PUMPS

Heavy duty, two ball bearing construction. Includes valuable service features of renewable shaft sleeve and casing wearing ring. This centrifugal line will handle up to 1100 gpm. and discharge at pressures to 200 ft. Also close coupled construction available.

PROPORTIONING PUMPS

Controlled or metered flow for chemical feed, for processes, boiler and municipal water treatment. Capacities may be varied automatically and manually in standard capacities from 0 to 3000 gph. and pressures to 5000 psi. Packaged chemical feed units available as complete control systems.



PUMPS WE

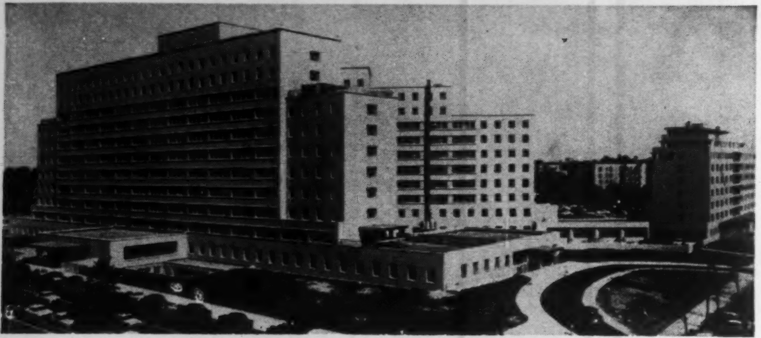
WALTER H. EAGAN CO. INC.

2336 FAIRMOUNT AVENUE, PHILADELPHIA, 30, PA.

DO YOU KNOW WHY

FAIRBANKS VALVES

ARE BEING SPECIFIED AND INSTALLED IN THE NATION'S NEWEST MOST MODERN BUILDINGS?



ELMHURST GENERAL HOSPITAL, ELMHURST, N. Y.

OWNER: Department of Hospitals, New York City, N. Y. **ARCHITECT AND ENGINEER:** York & Sawyer and Fellheimer & Wagner, New York, N. Y. **GENERAL CONTRACTOR:** Depot Construction Co., New York, N. Y. **HEATING CONTRACTOR:** Dierks Heating Co., Long Island City, N. Y. **PLUMBING CONTRACTOR:** Joseph F. Egan Co., New York, N. Y.

● Because Fairbanks Valves are Quality—DEPENDABLE—products.

● Because, over the past 67 years, long-lasting, trouble-free service has proven the DEPENDABILITY of Fairbanks Valves to the nation's leading consulting engineers, architects and contractors who have specified and installed these valves in the systems for which they were responsible. This acceptance of Fairbanks Valves is demonstrated by the fact that in over 50% of the new building construction described in an ENGINEERING NEWS-RECORD article "Office Building Boom Alters New York City Skyline", January 17, 1957, Fairbanks Valves were specified and installed.

● Because Fairbanks offers a full line of Bronze and Iron Body Valves for heating, piping and air conditioning systems.

● Because Fairbanks Valves are available the country over through stock carrying distributors in all the principal cities.

Do you have a copy of Fairbanks current Valve Catalog and Valve Comparison Chart? It will be a pleasure to send a copy of each to you.

THE **Fairbanks** COMPANY

EXECUTIVE OFFICE: 393 LAFAYETTE STREET, NEW YORK 3, NEW YORK

VALVES • DART UNIONS • CASTERS • TRUCKS • WHEELS

Branches:

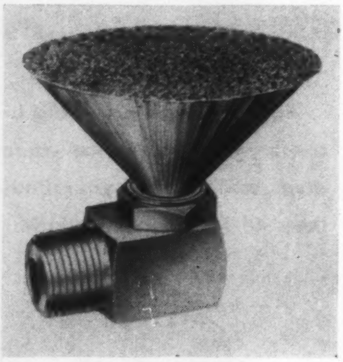
520 Atlantic Avenue Boston 10, Mass.
2600 So. Throop St. Chicago 8, Ill.
393 Lafayette Street New York 3, N. Y.
15 Stanwix Street Pittsburgh 22, Pa.
202 Division Street Rome, Ga.

Plants: Binghamton, N. Y. • Rome, Ga.

EQUIPMENT DEVELOPMENTS

Continued

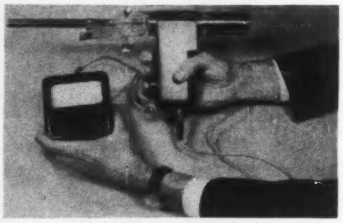
Available in copper or stainless steel outside cladding material; complete description, charts of tolerances, comparison of physical and mechanical properties in bulletin "IND-24" available on request.



Spray Nozzle . . .

. . . for industrial washing, cooling, brine spraying, foam and dust control, chemical processes—*Wm. Steinen Mfg. Co., 43 Bruen St., Newark, N. J.*

Available in 1/4, 3/8, 1/2 in. sizes with male or female connections; capacities from 0.50 to 10 gpm at 40 psi pressure.



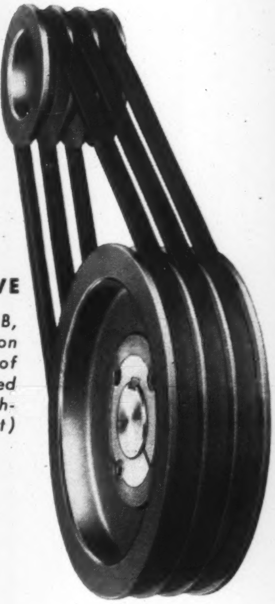
Portable Psychrometer . . .

. . . to measure moisture content of air by wet and dry thermistor beads —*Atkins Technical, Inc., 1276 W. Third Ave., Cleveland 13, O.*

Instrument has three scales for measuring humidity in temperatures ranging from 10 to 176 F; accuracy is within 0.5 percent of relative humidity and readability within 1/4 F; full information available in bulletin "HHVM" on request.

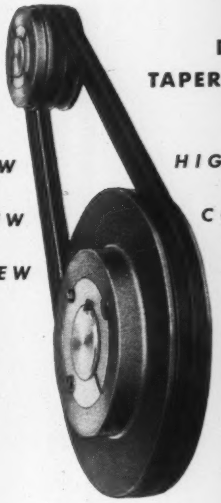
Announcing an entirely new line of V-Belt Drives . . . . .

DODGE DynaV



CONVENTIONAL TAPER-LOCK DRIVE

(— using standard A, B, C, D and E cross section belts, the hp ratings of which have been increased an average of 40% without any increase in cost)



DYNA-V TAPER-LOCK DRIVE

NEW HIGH CAPACITY

NEW COMPACTNESS

NEW SAVINGS IN COST

COMPARISON, ILLUSTRATED ABOVE — 3 HP, 1750 RPM, 2.41 TO 1 RATIO

	BELTS		SHEAVES			CENTER DIS-TANCE	HP	WEIGHT (LBS.)	COST	
	Number	Size	O.D. Driver	O.D. Driven	Width				Per hp	Per Drive
CONVENTIONAL TAPER-LOCK DRIVE	3	A42	4.15″	8.95″	2½″	12.3″	4.62	24.7	$5.62	$25.98
DYNA-V TAPER-LOCK DRIVE	2	3V400	3.35″	8.00″	1 3/32″	10.8″	5.0	18.0	$4.50	$22.50
% SAVING *Savings vary with different sized drives*			19%	10%	56%	12%	+	27%	19.9%	13.4%

Dyna-V Drives are sensationally compact. They are capable of handling up to three times as much horsepower in a given space. Dyna-V opens vast new possibilities for better, more economical machine design. And, in most instances, *Dyna-V costs less!*

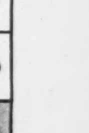
Narrower grooves, to match stronger, narrower Dyna-V Belts, greatly reduce the face width and the weight of Dyna-V Sheaves. Cost is lowered. Smaller diameter sheaves and shorter center distances multiply savings.

Dyna-V Sheaves decrease shaft overhang—increase bearing life. The new dimensional stability of Dyna-V Belts solves the problem of belt matching. Every belt carries its full share of the load.

Dyna-V Drives will be available for capacities from 1 to 1500 hp. Ask your Dodge Distributor. Or write us for new Dyna-V Bulletin.

DODGE MANUFACTURING CORPORATION, 1600 Union St., Mishawaka, Indiana

DODGE
of Mishawaka, Ind.



CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

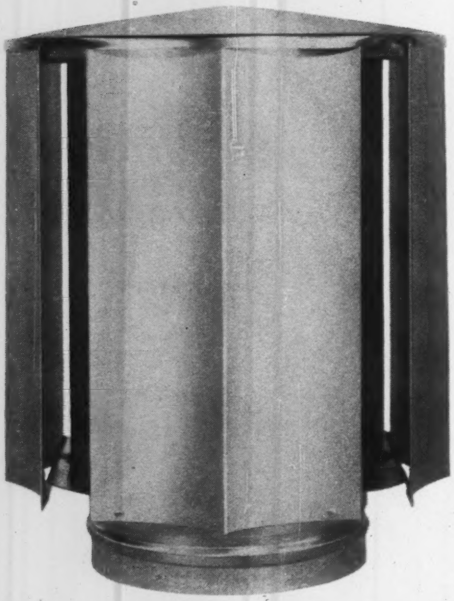
NEW **TRIANGLE AERO-FOIL VENTILATOR**

NO BACK DRAFT

HIGH CAPACITY

UNOBSTRUCTED AIR PASSAGE

NO MOVING PARTS



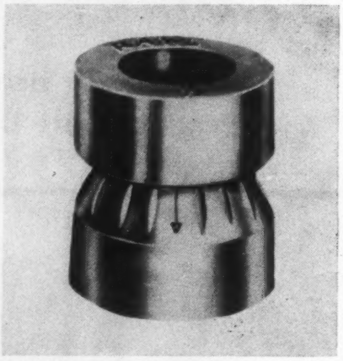
EFFICIENT AIRFOIL ACTION

Positive ventilation regardless of wind direction or velocity is assured by the aerodynamically correct design incorporated in the Triangle AERO-FOIL Ventilator. The baffles and airfoils are so designed that wind coming from any angle will be deflected to set up low pressure points, which in turn act to draw out the air from below the ventilator. Triangle AERO-FOIL Ventilators can be used on any type of building and operate efficiently in many applications where standard ventilator designs fail.

Write for AERO-FOIL Bulletin

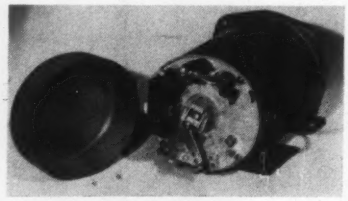
TRIANGLE ENGINEERING COMPANY

1301 Ashland • Houston 8, Texas



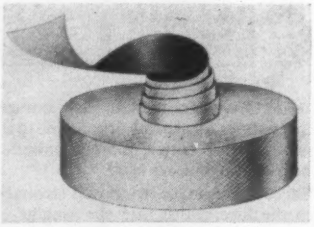
Bolt Anchors . . .
. . . designed for application where it is desirable to have bolt head out of hole—*Rawplug Co., Inc.*, 200 *Petersville Rd., New Rochelle, N. Y.*

Available in threaded style for ¼ to 1 in. diam bolts; recommended by manufacturer for heavy loads, or where overloads may be expected.



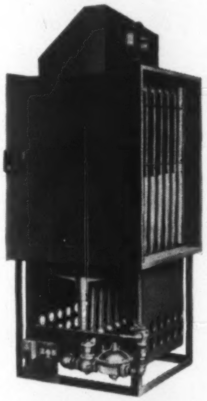
Jet Pump Motor . . .
. . . providing integration with pump it drives—*A. O. Smith Corp., Electric Motor Div.*, 531 *N.* 4*th St., Tipp City, O.*

Motor features sealed capsule design and single and three-phase pump motors from 1/3 to 3 hp.

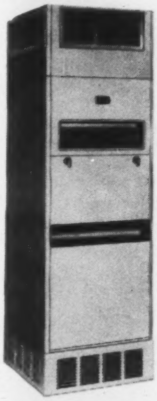


Asbestos Tape . . .
. . . for stripping metal and insulation joints—*Grant Wilson, Inc., Dept. HA*-8, 141 *W. Jackson Blvd., Chicago* 4.

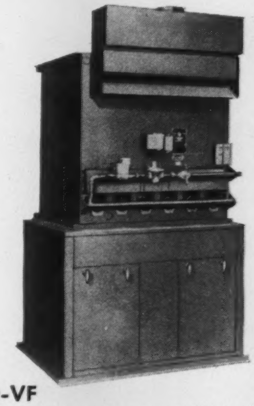
STAINLESS STEEL HEAT EXCHANGERS



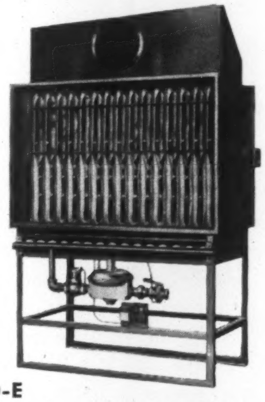
SED-S
Duct Furnace, 45,000 to 675,000 BTU Imput—End Surface



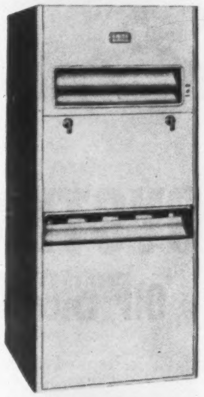
SEU-V
Vertical Unit Heater, 70,000 to 245,000 BTU Imput



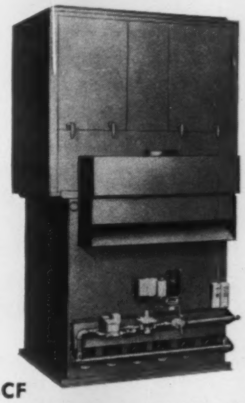
SED-VF
UP Vertical Duct Furnace, 70,00 to 280,000 BTU



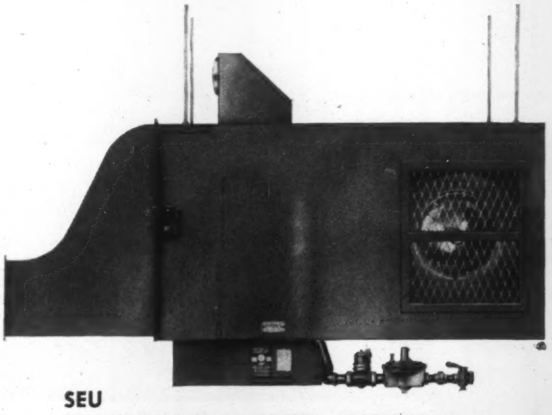
SED-E
Duct Furnace, 45,000 to 675,000 BTU Imput—Side Surface



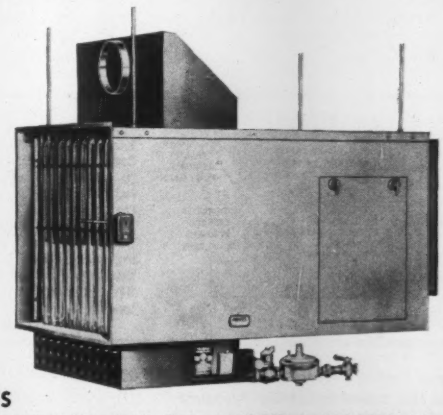
SEC
Forced Air Furnace, 70,000 to 245,000 BTU Imput



SED-CF
Counter Flow Duct Furnace, 70,000 to 280,000 BTU Imput



SEU
Suspended Unit Heater, 80,000 to 480,000 BTU Imput



SES
Suspended Forced Air Furnace, 80,000 to 480,000 BTU Imput

HAYES FURNACE MFG. & SUPPLY CO.
3233 SOUTH LA CIENEGA BOULEVARD, LOS ANGELES 16, CALIFORNIA
Telephone UPton 0-3734

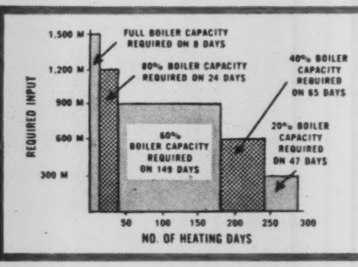
HYDROTHERM

PACKS
A 20%
GAS
SAVING
HERE
Here's where MultiTemp reduces gas costs by 20%. Return header has independent, differentially set aquastats that trigger each boiler, modulate input, and eliminate short cycling waste.

New MULTITEMP SYSTEMS
Make Gas Heat Competitive on "BIG JOBS"

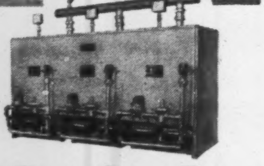
Now even the big jobs requiring up to 3,600,000 BTU/hr input can enjoy the convenience and cleanliness of gas heat. A Hydrotherm MultiTemp system achieves true input modulation, brings gas consumption down and, being composed of multiple units, insures against service interruptions.

A MultiTemp battery of Hydrotherm boilers is hooked up with a separate aquastat for each boiler in the common return header. With each aquastat set for a different temperature, the boilers are fired or cut off independently. When the demand is small, only one boiler operates... when it is great or when the system is making a cold start, the complete heating plant is fired.



This graph shows the year-round load for a 1,500,000 BTU/hr hydronic plant in Bergen County, N. J., where degree days average 5600 to 6000. Heat was required for 293 days, but full capacity was needed for only 3% of that time.

Note how a single 1,500,000 BTU/hr boiler would have short cycled for 89% of the heating season at a great loss in efficiency. Note also how the MultiTemp battery of five 300,000 BTU/hr boilers modulated its input to meet the heating demand of the moment.



- *Input Ratings from 360,000 to 3,600,000 BTU/hr*
- *100 lbs. ASME Working Pressure*
- *Boilers Shipped Pre-Wired and Assembled*
- *Units Pass Thru 2'6" Doors*
- *Ideal for Volume Hot Water*

Write today for MultiTemp Catalog

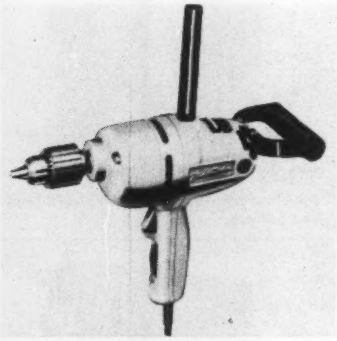
HYDROTHERM INC
DEPT. 13-AC NORTHVALE, NEW JERSEY

OTHER FAMOUS HYDROTHERM PRODUCTS: HydroTherm • HydroVector • HydroChiller • HydroFin

EQUIPMENT DEVELOPMENTS

Continued

Tape can be shifted slightly after stripping to correct for misalignment, smooth out wrinkles, and conform to seams, beads, and joints; available in rolls of 60 lineal yds in 2 or 3 in. widths.



Power Drill . . .

. . . for installation and service applications—*Black & Decker Mfg. Co., 628 Pennsylvania Ave., Towson 4, Md.*

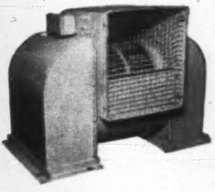
Tool is fitted with switch by which full power can be applied to turn auger in reverse, causing drill to back itself out of drilled hole; has drilling capacity of ½ in. in steel, ¾ in. in masonry with special bit, 1 in. in hardwood with auger, up to 1½ in. in sheet metal with hole saws.

Coil Cleaners . . .

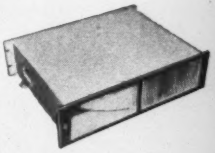
. . . for cleaning and restoring cooling capacity of cooling coils and cleaning permanent filters in air conditioning installations—*Lester Laboratories, Inc., P.O. Box 4897, Atlanta 2, Ga.*

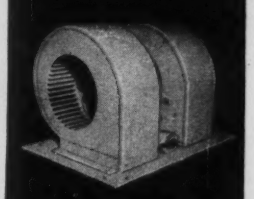
Product is non-toxic, non-flam-

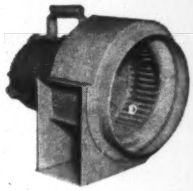
Pressure blower with 2-speed drive.


Exhaust blower with 3-speed drive.

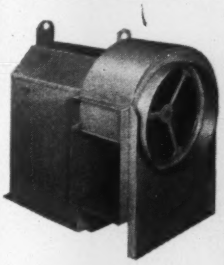
BLOWERS for ENCLOSURES...

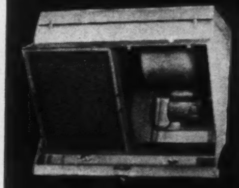

Cooling-air circulator for electronics. 500 CFM. 5-inch high cabinet.

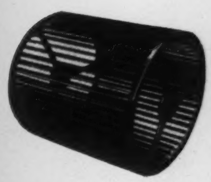

Twin pressure blower with 3-speed drive.

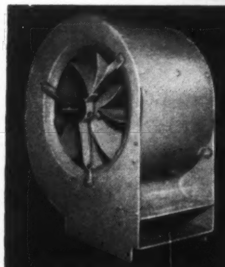

Portable unit for confined areas. High and low static applications.

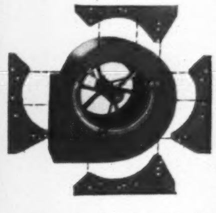
BLOWERS for VENTILATING...


Utility vent set with belt-drive blower.

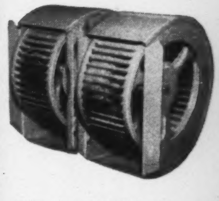

"Filtaire" for commercial kitchen ranges. Complete with blower, motor, grease filters (one removed in photo).

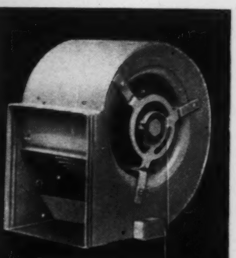

Porcelainized wheels and housings for corrosive conditions.

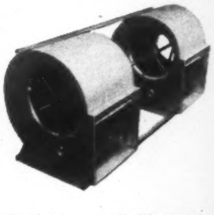

Belt-driven blower for material handling. Special forward curve paddle wheel. High RPM.


Four-way discharge blower for furnace industry.

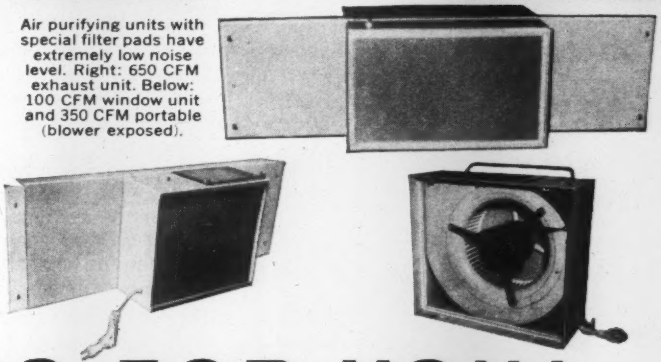
BLOWERS for HEATING, COOLING...


Direct-drive twin blower for low-noise applications.


Blower for central heating-cooling has Du-Air damper control for exact 2-volume air delivery.


Belt-driven twin blower with automatic damper control.

SPECIAL BLOWERS...


Air purifying units with special filter pads have extremely low noise level. Right: 650 CFM exhaust unit. Below: 100 CFM window unit and 350 CFM portable (blower exposed).

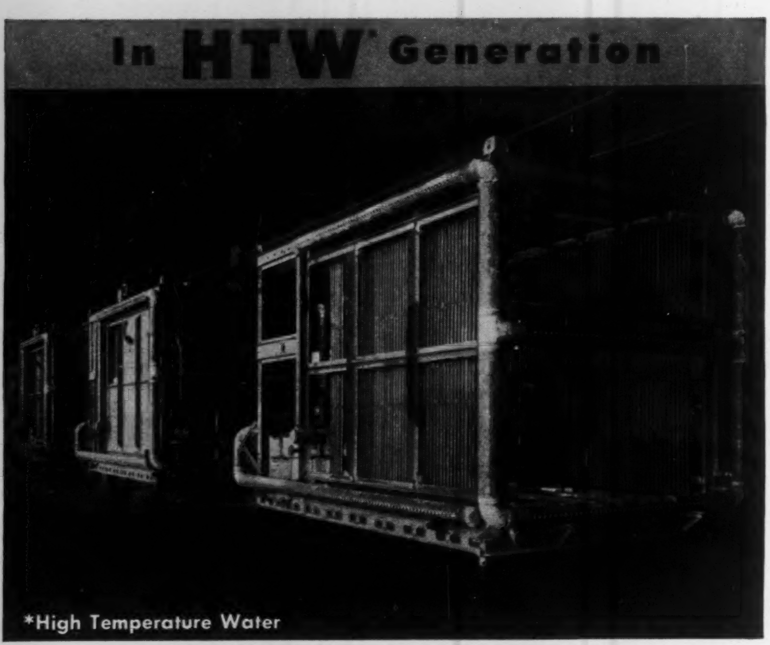
BLOWERS FOR YOU!

These are only a selection of the blower wheels and assemblies Morrison has developed for electronics, materials handling, ventilating, heating, cooling, air conditioning — virtually every type of air moving application.

What's your line? Send us your requirements ... put our specialized air moving experience to work for you.

Air Moving Specialists

MORRISON PRODUCTS, INC.
16818 Waterloo Road • Cleveland 10, Ohio
Fort Worth, Texas • Phoenix, Arizona



International-LaMont LEADS THE WAY

TYPICAL INSTALLATIONS

INDUSTRIAL & COMMERCIAL
Douglas Aircraft Corp.
Continental Can Co.
Union Carbide Nuclear Co.
Behr-Manning Co.
Johnson & Johnson
American Airlines Inc.
Bethlehem Steel Co.
New York International Airport
Ohio National Life Insurance Co.
Trans-Canada Air Lines
Bethlehem Pacific Coast Steel Co.
International Min. & Chem. Corp.

HOSPITALS
N. E. Florida Mental Hospital, Fla.
The Children's Hospital, Ohio
Bronx State Hospital, N. Y.
Loring AFB Hospital, Me.
Hadassah-Hebrew Medical Center, Israel

SCHOOLS & UNIVERSITIES
Rutgers University, N. J.
Hilltop Elem. School, Ohio
American River Jr. College, Cal.
Madeira High School, Ohio
Brigham Young University, Utah
Indian Hill Elem. School, Ohio
Holy Apostles School, Wisc.
Maple Park Elem. School, Ohio
Everett High School, Mich.
Avondale Elem. School, Ohio
Utica Jr. High School, Mich.
Whitewater High School, Wisc.
College of Great Falls, Mont.
The Colorado College, Colo.
St. Joseph Seminary, La.
Blossom Hill School, Ohio
Plus 21 U. S. Air Force and Navy Bases.

More than 130 International-LaMont High Temperature Water Generators already in operation have a total capacity exceeding THREE BILLION Btu/hr.

This unequalled acceptance underlines a significant point. It is not enough merely to heat and distribute water at temperatures to 430° F. or more. The *real* economy of HTW is in the *magnitude* of the temperature differential between boiler discharge and return water.

Making full use of the proven LaMont principles of forced recirculation, International-LaMont Generators permit temperature differentials to 200° F. or more with *no danger of thermal shock.* Here is the key to major capital and operational savings throughout the system. In addition, International-LaMont counterflow design assures optimum heat absorption and high operating efficiency.

Investigate the *true* economy of high temperature water in terms of International-LaMont Forced Recirculation Generators.

Get full details from your
INTERNATIONAL DISTRICT REPRESENTATIVE
or write for Bulletins 700 and 1000 today.

BOILER BUILDERS SINCE 1886

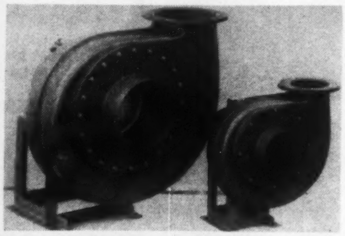
THE INTERNATIONAL BOILER WORKS CO.

Steel Firebox Heating & Power Boilers Low & High Pressure Water Tube Package Boilers • International-LaMont Forced Recirculation Generators • ASME Code Pressure Vessels & Welded Products.

810 Spruce St. East Stroudsburg, Pa.

Manufactured and sold in Canada under agreement with CANADIAN VICKERS LTD. Montreal, P. Q.

mable, non-corrosive; requires about 15 min to clean very large cooling coil.

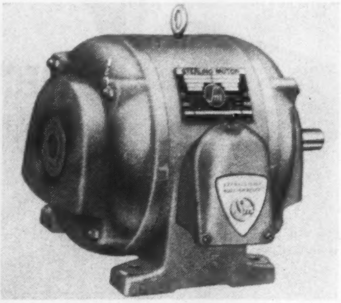


Plastic Blowers . . .
. . . for application wherever resistance to acids and corrosive gases is important—*Milo Mfg. Co., 302 N. Broad St., Elizabeth, N. J.*

Descriptive bulletin available with performance curves and data, information on electric consumption at various rpm, illustrations of mounting positions.

Room Air Conditioner . . .
. . . featuring major style changes—*Carrier Corp., Syracuse 1, N. Y.*

Available in 20 different models of seven lines; capacities range from 7000 to 18,000 Btu per hr.



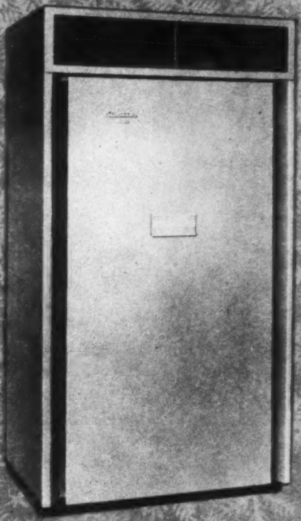
Drip-Proof Motors . . .
. . . with full overload characteristics on such applications as food processing, and chemical piping—*Sterling Electric Motors, 5401 Telegraph Rd., Los Angeles 22, Calif.*

Designed to operate under adverse conditions of continuous and excessive moisture, high humidity and temperature, salt spray, dust, oil; available in all ratings from $\frac{1}{2}$ to 50 hp, any phase frequency or voltages,

Curtis

CONDITIONS COMMERCIAL AMERICA...

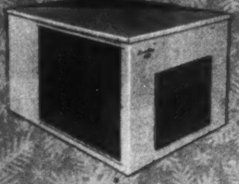
See our exhibit—
Booth 320
SOUTHWEST HEATING & AIR CONDITIONING EXPOSITION
Dallas, Texas
February 1 thru February 4, 1960

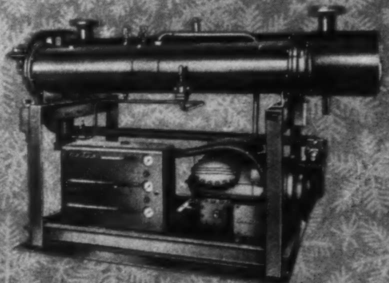


Curtis packaged units minimize floor area required. Factory assembled and tested. Field installation requires only setting and connecting utilities.

PACKAGED AIR CONDITIONERS UP TO 100 TONS.

AIR-COOLED UNITS UP TO 10 TONS.





PACKAGED LIQUID CHILLERS UP TO 100 TONS.

PRECISION

close tolerance manufacturing, builds peak performance into every CURTIS unit.

Curtis is the "luxury line" in the air-conditioning industry. Silence, efficiency and long-life are inherent in Curtis design.

Yet Curtis prices are right in line.

This is why Curtis designs and builds thousands of unique air conditioning systems for commercial America . . . why Curtis is able to maintain a family of over 300 representatives and servicing contractors across the nation.

Put the advantages of CURTIS PRECISION into your next job.

Curtis
MANUFACTURING COMPANY
REFRIGERATION DIVISION

OUR 105th YEAR

WRITE DEPT. 5, ST. LOUIS 20, MISSOURI

THE CURTIS "LUXURY LINE" OF AIR CONDITIONERS COSTS NO MORE

See and learn about The Newest Products at the

2nd Southwest

HEATING & AIR-CONDITIONING EXPOSITION

(under the auspices of ASHRAE)

Dallas, Texas · Feb. 1-4, 1960

Memorial Auditorium

Held in conjunction with the semi-annual meeting of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, this important exposition will bring an unprecedented concentration of technical information to Dallas . . . vital information you'll need to keep abreast of the changes and developments affecting your day-to-day operations.

SEE more than 200 informative displays covering recent progress in air handling and treating equipment as well as refrigeration.

MEET more than 1000 technical representatives of the leading manufacturers in your industry.

DISCUSS with them how their new products can lead to bigger profits for you.

COMPARE and judge at first-hand the relative merits of competitive products.

DECIDE which of them can best suit your needs.

2211

2nd Southwest

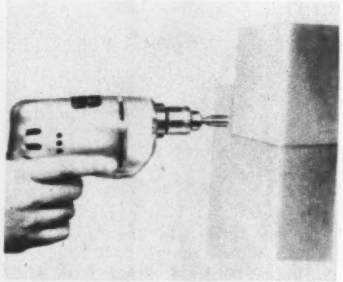
HEATING & AIR-CONDITIONING EXPOSITION

Management: International Exposition Company, Inc.
480 Lexington Ave., New York 17, N. Y.

EQUIPMENT DEVELOPMENTS

Continued

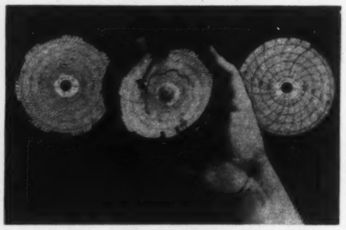
torque or slip characteristics, and with multi-speed winding.



Drill-Screw . . .

. . .that drills its own hole in metal—*Duro-Dyne Corp., Route No.* 110, *Farmingdale, N. Y.*

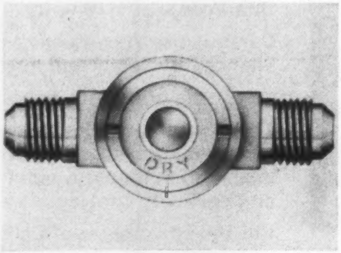
Screw will penetrate and engage securely in sheet metal without necessity of pre-drilled or punched hole when driven by standard 1/4 in. high-speed electric drill.



Recording Thermometer

. . .for recording temperatures of liquids or wet environments—*Pacific Transducer Corp.,* 11836 *W. Pico Blvd., Los Angeles* 64, *Calif.*

Uses spring wound clock movement in two time ranges; 20 F to 220 F or −40 F to 160 F; available in 24 hr or 7 day time ranges.



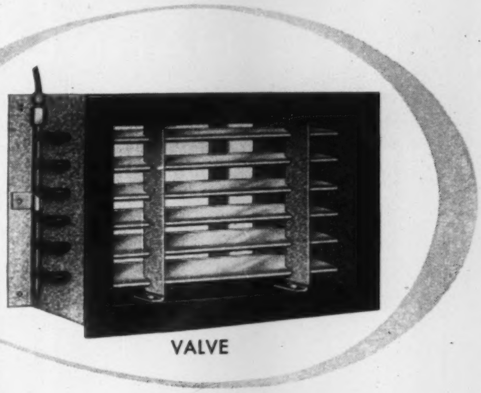
Moisture Indicator . . .

. . .in which degree of moisture content is in refrigerant is indicated as "wet" or "dry"—

again... CONNOR'S Creative Engineering produces another Beneficial Advance in

HIGH VELOCITY AIR DISTRIBUTION EQUIPMENT

45° AIR INLETS



the series 45P VALVE ATTENUATOR

Designed especially for Dual Duct, Constant Volume Systems

Here's the new Kno-Draft Series 45P Valve Attenuator, designed especially for dual duct, constant volume high velocity air distribution systems—a product created by the same engineers who developed the unique Helical Spring Damper in '58 and revolutionary Pneumavalve in '59.

The Series 45P offers distinct application superiority over motorized valves because of these features:

- NO MOTORS, NO LINKAGE used—foolproof function through pneumatically activated airfoil valves and controls . . . no moving parts to loosen or wear . . . no future decrease in capacity owing to clogged perforations.
- Acute sensitivity to slightest variation in control pressure . . . no hysteresis.
- Flexibility of operation . . . constant volume operation normally, with fast warm-up when required.
- Positive mixing of hot and cold air . . . no stratification.
- Ultra-quiet operation . . . valve surfaces are flocked . . . all baffles and internal surfaces are lined with one-inch coated acoustical material.

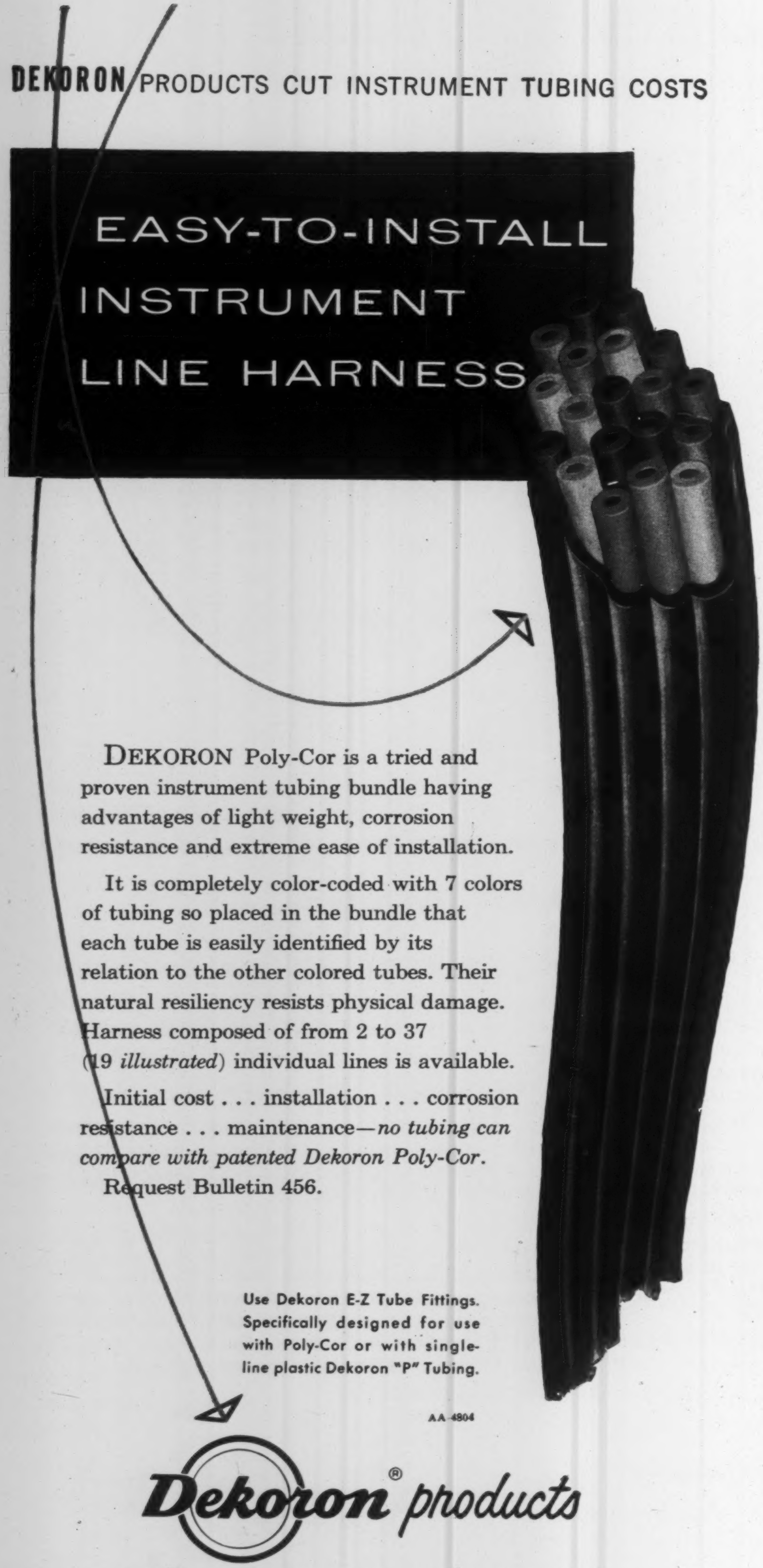
As with all Connor products, the reliability of the Series 45P is backed by more than forty years of experience in the development and application of air handling equipment. For complete selection and application information on the Series 45P, request Bulletin K-45 from the Connor sales engineer near you, or from Connor Engineering Corporation direct.

REQUEST BULLETIN K-45

CONNOR... for Constant Comfort Conditions

CONNOR ENGINEERING CORPORATION
DANBURY • CONNECTICUT

CONNOR ENGINEERING CORPORATION
kno·draft®
high velocity air diffusers



DEKORON PRODUCTS CUT INSTRUMENT TUBING COSTS

EASY-TO-INSTALL
INSTRUMENT
LINE HARNESS

DEKORON Poly-Cor is a tried and proven instrument tubing bundle having advantages of light weight, corrosion resistance and extreme ease of installation.

It is completely color-coded with 7 colors of tubing so placed in the bundle that each tube is easily identified by its relation to the other colored tubes. Their natural resiliency resists physical damage. Harness composed of from 2 to 37 (19 *illustrated*) individual lines is available.

Initial cost . . . installation . . . corrosion resistance . . . maintenance—*no tubing can compare with patented Dekoron Poly-Cor.*

Request Bulletin 456.

Use Dekoron E-Z Tube Fittings. Specifically designed for use with Poly-Cor or with single-line plastic Dekoron "P" Tubing.

AA 4804

Dekoron® products

quality
research
service

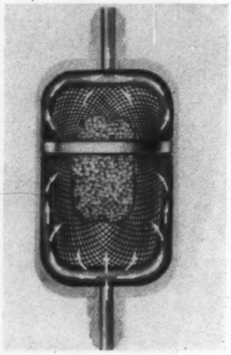
SAMUEL MOORE & COMPANY • MANTUA, OHIO
DEKORON PRODUCTS DIVISION

EQUIPMENT DEVELOPMENTS

Continued

—*Henry Valve Co.,* 3215 *North Ave., Melrose Park, Ill.*

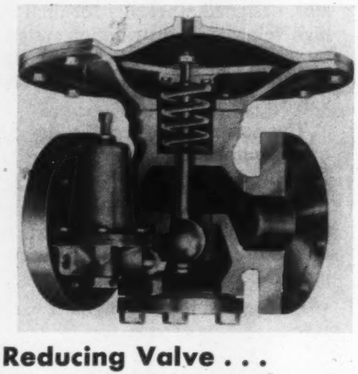
Adaptable for use with equipment using refrigerants 12 or 22; element changes color in relation to amount of moisture present.



Filter-Driers . . .

. . . for refrigeration systems—*Mc-Intire Co., Okner Parkway, P.O. Box 5, Livingston, N.J.*

Available in 20 models covering ½ to 10 ton systems; filter enclosure completely encases desiccant on all sides and removes all solid foreign matter from refrigerant before it enters desiccant chamber; descriptive bulletin "D-5" available on request.



Reducing Valve . . .

. . . to meet requirements for use at most steam pressure reducing valve installations—*Klipfel Valves, Inc.,* 1075 *Lincoln Ave., Hamilton, O.*

Designed with spherical hard stainless steel ball inner valve which closes against monel seat ring; main valve is stainless steel to permit use with higher pressures and tempera-

THE BURGESS-MANNING 3-WAY FUNCTIONAL CEILING

UNIFORM RADIANT HEATING
UNIFORM RADIANT COOLING
UNIFORM SOUND ABSORPTION

has the

SIX POINTS of SUPERIORITY

that make it your Best Buy

- **STRUCTURAL SIMPLICITY**
- **MAINTENANCE ECONOMY**
- **ACOUSTICAL EFFICIENCY**
- **THERMAL PERFORMANCE**
- **VISUAL SATISFACTION**
- **FLEXIBILITY**
  Design & Physical

STRUCTURAL SIMPLICITY

Installed with usual suspended ceiling methods and components . . . no special framing for troffers . . . space above ceiling instantly accessible.

MAINTENANCE ECONOMY

Ceiling surface easily washable . . . all individual panels easily and quickly removable without damage . . . no mechanical maintenance . . . nothing to get out of order.

ACOUSTICAL EFFICIENCY

Choice of sound absorption coefficients identical to those of standard perforated metal panel acoustical ceilings . . . highest obtainable with regular construction.

THERMAL PERFORMANCE

Uniform heating and cooling . . . the only ceiling having direct contact between pipe grids and panels for even, efficient thermal conduction over the entire heating and cooling area.

VISUAL SATISFACTION

Special decorative designs available through variety of combinations in color, surface texture, inter-mixed panel sizes. Standard finish; — high-grade baked-on flat off-white enamel complementing all room colors.

FLEXIBILITY

Thermally and visually adaptable to any building module . . . panels and troffer lights interchangeable . . . panels salvageable for continued use in future remodelling and room changes.

For complete descriptive information, write for "The Story of The Burgess-Manning Ceiling." It tells how you can obtain the ultimate in indoor comfort.

Heating
Cooling
Acoustical

BURGESS-MANNING COMPANY
Architectural Products Division
713 East Park Avenue, Libertyville, Illinois

the only
masonry drill-anchor
that's
DURATHERM
HEAT-TREATED
for drilling power
plus holding power...
RAWL
SABER-TOOTH

RAWL
SABER-TOOTH
DRILL-N-ANCHOR

for fastening any kind of fixture to any kind of masonry

- **hardened** so teeth keep their edge, drill a full hole fast
- **toughened** so teeth won't snap off, even in hardest concrete

...CUTS COSTS ALL-AROUND

- The anchor is the drill... no separate drills to handle or sharpen... no problem of matching sizes.
- "Core drill" design saves drilling time and labor.

DRILLS FAST...HOLDS TIGHT...

- Drills its own hole in the hardest concrete, develops highest holding power.
- Tapered holding ridges around body make the Saber-Tooth bite harder, grip tighter.
- Expander slots assure complete, even expansion when anchor is driven home—teeth undercut hole deep in the masonry.
- All-steel construction resists shock, vibration, fire, rust.
- Snap-off joint is strong enough to hold during drilling, yet breaks clean after the anchor is in place.

Snap-off Flush Type
Hand Flush Type
Rod Hanger Type
Tie Wire Type

Try the Saber-Tooth for yourself, at our expense, on your toughest masonry anchoring job... send the coupon for free sample and full information.

THE RAWLPLUG COMPANY, INC.
252 Petersville Road New Rochelle, N.Y.

Please rush my Saber-Tooth sample and complete facts.

Name..

Firm..

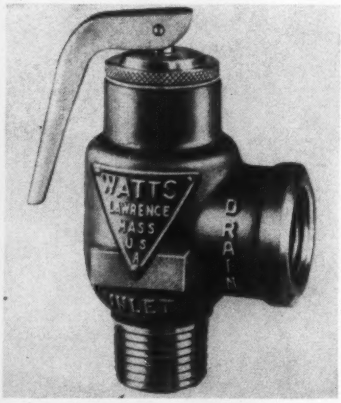
Address..

.... R8

EQUIPMENT DEVELOPMENTS

Continued

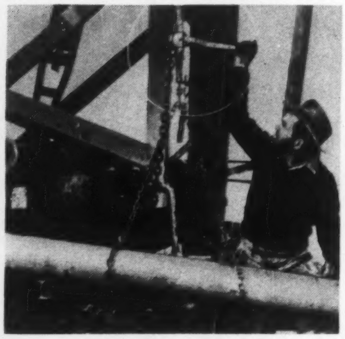
tures; available in 3/4 to 4 in. sizes with bronze, semi-steel, or cast iron body; screwed ends offered up to 3 in.; flanged bodies from 1 1/4 to 4 in.; bulletin "600" available on request.


WATTS
LAWRENCE
MASS
U S
A
DRAIN
INLET

Pressure Relief Valve . . .

. . .featuring all-bronze (85 percent copper) body, stainless steel spring —*Watts Regulator Co.,* 10 *Embankment Rd., Lawrence, Mass.*

Available in 1/2 × 1/2 in. and 3/4 × 3/4 in. sizes; complies with latest standards.



Hoist Puller . . .

. . .to lift, lower, move, or pull pipe, heating and air conditioning units, and equipment, to brace units being installed or removed, to support pipe over excavations—*American Gage & Mfg. Co., Dept.* 0-42, 125 *Bayard St., Dayton* 1, *O.*

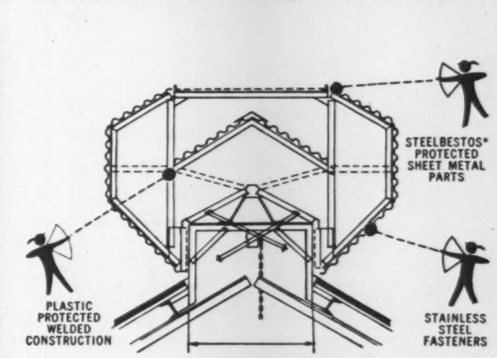
IS EFC* YOUR VENTILATOR PROBLEM?
*EXHAUST FUME CORROSION

BOWMAN VENTILATORS HAVE 3-WAY LASTING PROTECTION

Specify and use the ventilator line that is job-engineered to give long years of maintenance-free performance. Bowman's *3-Way Lasting Protection* is available on the complete line of ventilators and louvers:

- Round Gravity
- Continuous Ridge
- Round Power
- Automatic Power
- Duct Fans
- Louvair
- Industrial Louvers

Technical Bulletins describing each of the above in detail are available on request. Write today!

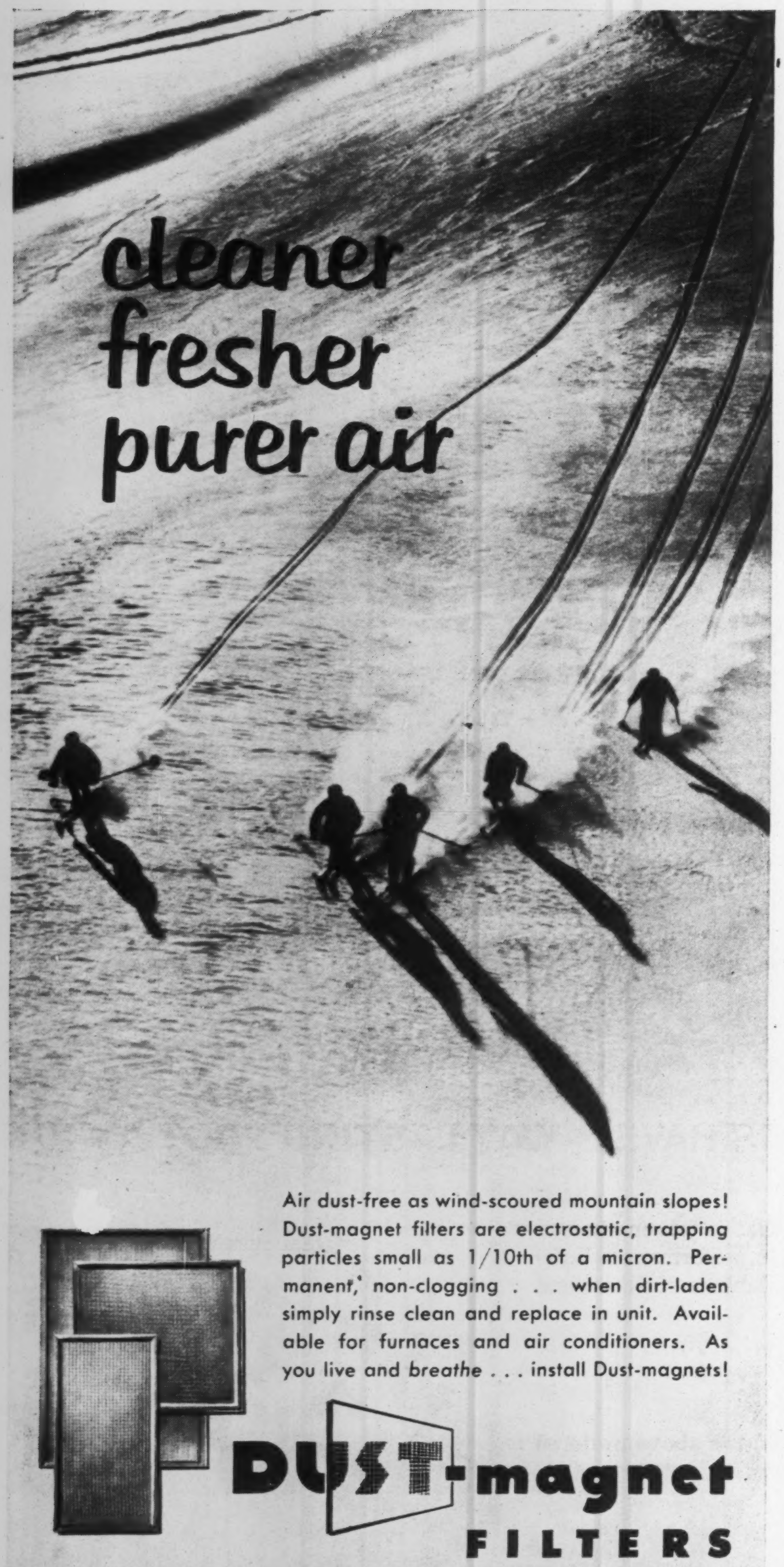

STEELBESTOS* PROTECTED SHEET METAL PARTS
PLASTIC PROTECTED WELDED CONSTRUCTION
STAINLESS STEEL FASTENERS

BOWMAN STEEL CORPORATION

Industrial and Commercial Ventilators

P. O. Box 2129 Pittsburgh 30, Pa.

*Bowman Steelbestos is a patented fire-resistant asphalt-asbestos protective coating applied to a galvanized steel core that prevents rust or corrosion in any atmospheric condition. It is approved by both the Underwriters' Laboratories and Associated Factory Mutual Fire Insurance Companies.



Air dust-free as wind-scoured mountain slopes! Dust-magnet filters are electrostatic, trapping particles small as 1/10th of a micron. Permanent,* non-clogging . . . when dirt-laden simply rinse clean and replace in unit. Available for furnaces and air conditioners. As you live and *breathe* . . . install Dust-magnets!

DUST-magnet FILTERS

a product of Stoddard Industries

3383 E. Layton Ave., Cudahy, Wisconsin

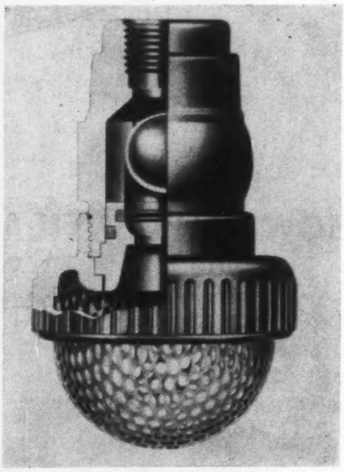
EQUIPMENT DEVELOPMENTS

Continued

Model has 1½ ton capacity in 3/16 in. preformed aircraft cable weighing 7½ lb; new feature permits cable replacement in minutes.

Air Sampler . . .
. . . to collect dusts and aerosols and determine concentration of radioactive particles, toxic metals, air pollutants—*Gelman Instrument Co.*, 106 *N. Main St., Chelsea, Mich.*

Can be used to sample rates up to 100 cfm; can be furnished for 110 v 50-60 cycle a-c current or 220v d-c operation.



Plastic Valves . . .
. . . for use in sumps, tanks, etc., where fluid level must be lowered —*Chemtrol*, 10872 *Stanford Ave., Lynwood, Calif.*

Furnished in ½ through 2 in. sizes; contains ball type check valve preventing back flow; suction end is protected against intake of debris with hemispherical plastic screen.

made better to bring out the ***BEST*** *in every installation*

COPPER WATER TUBE
1"K
3/4"L
SCOVILL
SOLID COPPER produced by
New Milford, Connecticut
QUALITY AND SATISFACTION THROUGH YOUR WHOLESALER

you hear about it everywhere!

Wholesalers like it . . . contractors like it . . . journeymen like it! It's the NEW standard of service and quality they're finding in these bright new packages of Copper Tube and Pipe from Scovill. Stands to reason that the NEWEST multi-million dollar Scovill Tube Mills, with every known aid to control of quality, WILL deliver the finest possible tube mill products. Stands to reason, too, that the vigorous all-new . . . but old-in-experience . . . coast-to-coast Scovill sales and service organization WILL deliver superior service. Make it Scovill on your next job. We'll promise to make you a regular customer.

• Place your order through your **Wholesaler** •

COPPER WATER TUBE K-L-M
COPPER DRAINAGE TUBE (DWV)
COPPER THREADLESS PIPE (TP)
COPPER PIPE
RED BRASS PIPE
COPPER REFRIGERATION TUBE

MADE IN U.S.A.
TO THE STANDARDS
OF AMERICAN INDUSTRY

SCOVILL is the **new** standard in

. . . .

copper water tube®

SCOVILL MANUFACTURING COMPANY • COPPER TUBE MILL PRODUCTS, WATERBURY, CONN.

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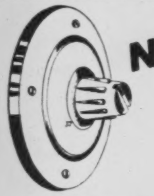
DURO DYNE *leads the field!*

The Greatest Name in Sheet Metal Specialties



NEW!

"DURO-TROL"*†

For installation in exposed areas where smart, modern appearance and ease of adjustment are of prime importance DURO-TROL Air-Flow Regulator is the answer!

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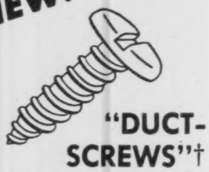

"DUCT-SCREWS"†

Designed for Sheet Metal men. Tops in quality and holding power. Binding Head . . . sharp points . . . superior hardening plus heavy cadmium plating. Buy the original economical Thousand-Pack.

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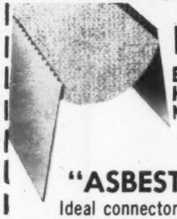
Available in handy, disposable caulking gun cartridge to eliminate waste and mess. Cartridge produces a ⅜" bead of sealer under pressure. Also in 1 gallon cans.



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ECONOMICAL!
HEAT-RESISTANT!
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Ideal connector for all furnace installations. Costs less than ordinary asbestos. GRIP-LOC seam to attain greatest gripping action. Asbestoseal is Underwriters Grade asbestos sealed by silver-colored neoprene.

NEW

"DRILL-SCREWS"†

Drill their own holes in metal!

Acclaimed by sheet metal workers coast-to-coast! Drill Screws **are installed five times faster than conventional methods!** All you need is a ¼" electric drill and an inexpensive Drill Screw Chuck. Can also be driven manually. Write for samples and full details.

* PATENTED OR PATENT PENDING
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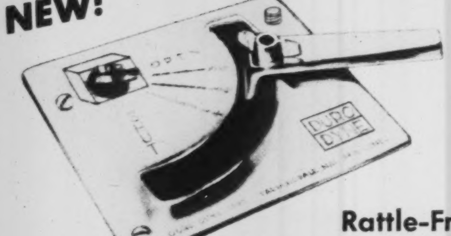

Rattle-Free ⅜" REGULATOR SETS*

Super heavy construction of this new regulator and its wedge-lock action prevents damper rattle while it minimizes air leakage. New, eye-appealing design, easy-to-read and easy-to-adjust indicator dial.

PLUS

- ★ THE ORIGINAL AND MOST COMPLETE LINE OF REGULATORS, QUADRANTS AND DAMPER PARTS
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- ★ BLADE KITS AND OPAX KITS FOR MULTI-BLADE DAMPERS
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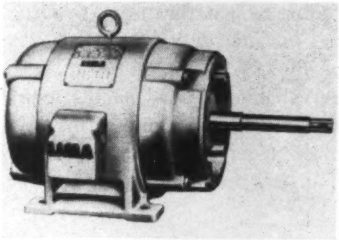
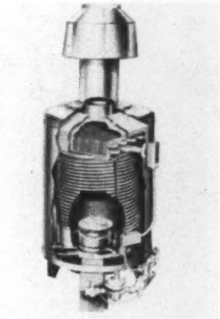


Pump Motor . . .

. . . can be furnished in either two or three-phase in all frequencies and commercial voltages below 600 v—*Lima Electrical Motor Co., Inc., Dept.* 519, *Lima, O.*

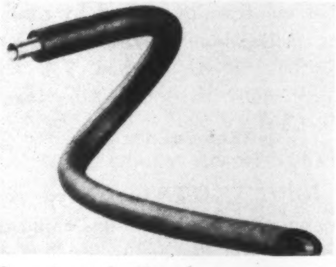
Available in ½ hp at 900 rpm through 75 hp at 1800 rpm; explosionproof and totally enclosed fan cooled from ½ hp, 900 rpm through 30 hp.



Water Heater . . .

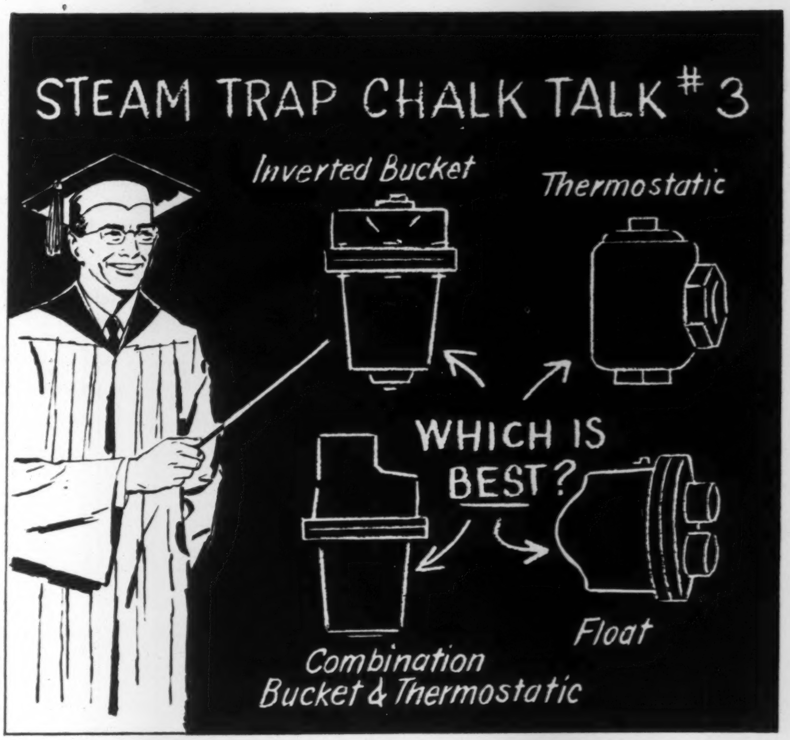
. . . with application to hotel operations—*A. O. Smith Corp., Permaglas Div., Kankakee, Ill.*

Unit has 300,000 Btu per hr input; will heat 288 gph water at 100 F temperature rise; may be installed as recovery booster heater.



Pipe Insulation . . .

. . . of preformed neoprene which flexes to any pipe configuration, ac-



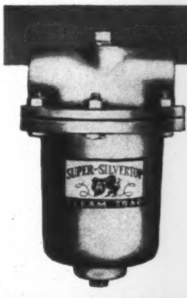
Is one trap design better than another?

- The steam trap user is often confused by the fact that there are four different designs of traps on the market. Is one better than another, and if so, which one should he use?

Actually, each design of trap has its place, *depending upon the application*. For example, thermostatic traps are preferred for chemical, petroleum and other outdoor applications because they cannot freeze. However, they do not compare in efficiency with inverted bucket traps for normal inside use. Where fast heating up is required, the combination bucket and thermostatic trap permits steam units to reach maximum heat 2½ times faster. For continuous service, float traps are best.

For sound recommendations, ask Anderson. Manufacturing a complete line of traps, in all designs, they give unbiased counsel. Their engineering catalog, "How to Select Steam Traps and Other Fluid Specialties" contains hundreds of worthwhile recommendations. Mail coupon for your copy today.

A TRAP FOR EVERY PURPOSE



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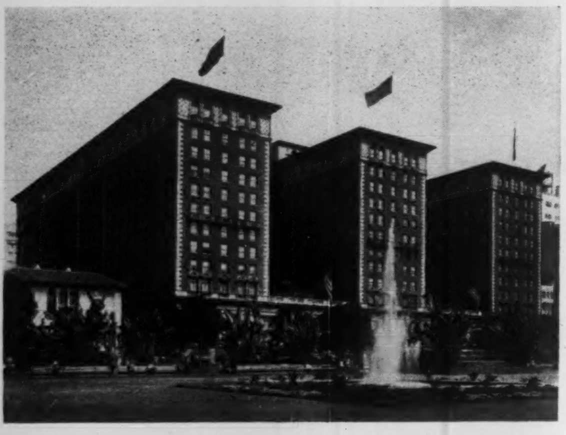

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NOW!

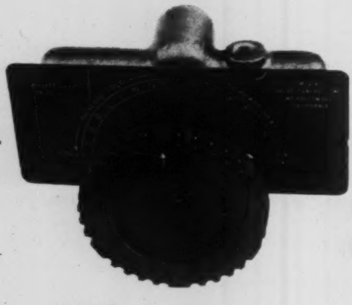
MANUAL CONTROL AFFLECK STEAM-WATER VALVE

COMBINATION STEAM VALVE AND A 3-WAY MIXING VALVE FOR SMALL ROOM AIR CONDITIONING UNITS

Every now and then a new product is developed that establishes a major advance in its field. The new Affleck Steam-Water Valve is such an innovation.

This Affleck Steam-Water Valve comprises as one valve a steam control unit and a three way chilled water mixing unit. Turning the Knob 90° to the left regulates the chilled water. 90° turn to the right regulates the steam. This arrangement provides that the water unit of the valve is completely turned off before the steam unit is turned on.

The Affleck Steam-Water Valve is a small compact all brass and stainless steel construction giving years of trouble free service. This versatile valve is very low in original cost and can be joined to a motor operator if so required.



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VALVE CONTROLS, INC.

11120 CUMPSTON ST. NORTH HOLLYWOOD • CALIFORNIA

cording to manufacturer—*Grant Wilson, Inc., Dept. HA-8,* 141 *W. Jackson Blvd., Chicago* 4.

Available in 6 ft lengths with 3/8 or 1/2 in. wall thicknesses for copper tubing from 1/4 to 3 in. and for iron pipe sizes from 1/4 to 2 1/2 in.

Equipment Briefs . . .

PRESSURE SENSITIVE TAPE for use as product markings; adhesive is protected by clear top coat and polyester film. *Meyercord Co.,* 5323 *W. Lake St., Chicago* 44.

ACOUSTICAL PANEL for reduction of noise in offices, factories, schools; available in light color veneer type finish. *Elof Hansson, Inc.,* 711 *Third Ave., New York* 17.

TUBE STAPLES for supporting piping, tubing, cable, and conduit; available in sizes to accommodate tube in 1/2, 1/4, 3/8, 3/4 in. nominal sizes. *Chase Brass & Copper Co.,* 236 *Grand Ave., Waterbury* 20, *Conn.*

MASTIC SEALANT based on synthetic rubber with applications in sealing where prolonged exposure to sunlight, water, ozone, strong chemicals, heat, abrasion, movement are factors; retains rubber-like qualities over temperature range of −40 to 250 F. *Wiltbank-Czygan, Inc.,* 208 *Governor Printz Blvd., Claymont, Del.*

PIPE CUSHION-CLAMPS to prevent mal-function caused by insulating material decomposing and leaving bare metal exposed. *TA Mfg. Corp.,* 4607 *Alger St., Los Angeles* 39, *Calif.*

JOINT SEALER in new type rigid container with built-in applicator permanently attached to inside of can top and stored within container. *Highside Chemicals, Inc.,* 10-14 *Colfax Ave., Clifton, N. J.* ǂ

Rittling THE NAME THAT GUARANTEES YOU . . .

The finest finned tube heating equipment, designed and built to provide structural sturdiness and installation convenience which, together with output performance, makes each installation a symbol of good workmanship, and promotes new business—

in

- **schools, churches, hospitals, and institutions**
- **housing projects, apartments and private homes**
- **business places, industrial plants, and commercial buildings**

Rittling Heating and Ventilating equipment reflects the smart new design that has such a universal acceptance by Architects, Engineers, Contractors and Users.

Rittling
◀ **CABINET UNIT HEATERS**
Warming Units for instantaneous output with automatic control.

Rittling
FINNED TUBING ▶
Steel and copper tubing, steel and aluminum fins. For heating and cooling.

Rittling
◀ **UNIT VENTILATORS**
Blend fresh air, filter and gently circulate warmed air under complete automatic control.

Rittling
SIL-VECTORS ▶
For a wide range of heating applications.

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◀ **SIL-N-WALL RADIATION**
Radiation in a cabinet that forms window sill and wall surface.

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5 in 1 BASEBOARD RADIATION ▶
Five different finned tubes fit one size enclosure for the broadest application and hydraulic flexibility.

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UNIT VENTILATORS
STORAGE CABINETS
CABINET CONVECTORS
BASEBOARD RADIATION
SIL-VECTOR RADIATION
WALL RADIATION
SIL-N-WALL RADIATION
CABINET UNIT HEATERS
UNIT HEATERS
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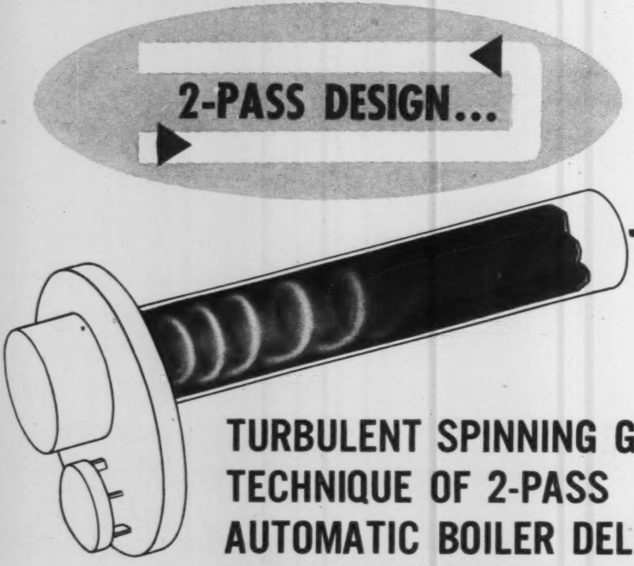


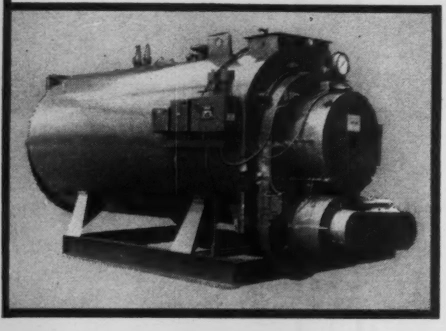
TURBULENT SPINNING GAS TECHNIQUE OF 2-PASS AUTOMATIC BOILER DELIVERS MAXIMUM HEAT TRANSFER

One of the important design features that contributes to the efficiency and economy of the Continental 2-Pass Boiler is its unique firing method. Regardless of fuel type, the Continental delivers maximum utilization of primary surfaces with a highly radiant, turbulent Spinning Gas Technique.

WHAT IT DOES...

The Spinning Gas Technique provides a high rate of heat transfer through the large diameter water-cooled furnace, and completes combustion in approximately ⅔ the length of the furnace. Heat load is thus reduced so effectively that only a single return pass of tubes is needed to assure better than 80% efficiency.

FEATURES AND PERFORMANCE...



15 to 600 HP Steam Boilers —To 250 PSI

Hot Water and HTW Boilers

Oil, Gas, Combination Oil/Gas

A new bulletin gives you complete data on the compact, cost-saving Continental 2-Pass Automatic Boiler. Send today for Bulletin BE-400.

CONTINENTAL BOILER DIVISION
BOILER ENGINEERING & SUPPLY CO., INC.
Phoenixville, Pa.

1960: a year of promise

(continued from page 64)

slag welding may find important applications in the welding of heavy sections.

"Vacuum brazing will find increased use in the production of heat-extractive brazed bimetals, as in the brazing of relatively thick high-thermal conductivity copper to a thinner tantalum sheet in missile components.

"Commercial applications may develop for the high temperature plasma torch to meet the needs of the space age for high temperature reactive metals, difficult cutting problems, and, possibly, some fusion welding. Explosive welding, utilizing techniques similar to those used for explosive forming, is being studied and may become another important 'cold welding' process," Mr. Plummer reported.

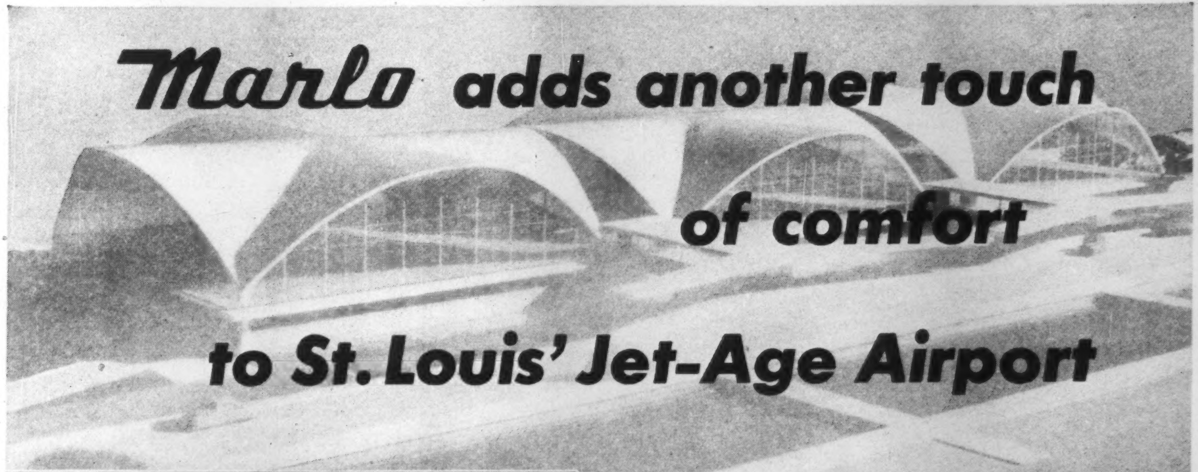
Good Gas Future In '60

THIS YEAR has been targeted as one of action in the gas industry, according to C. S. Stackpole, managing director of the American Gas Association.

Gas air conditioning is expected to become even more important in 1960. Manufacturers plan to present more major new types of air conditioning units than in any previous year on record. In addition, several new manufacturers are entering the gas air conditioning field.

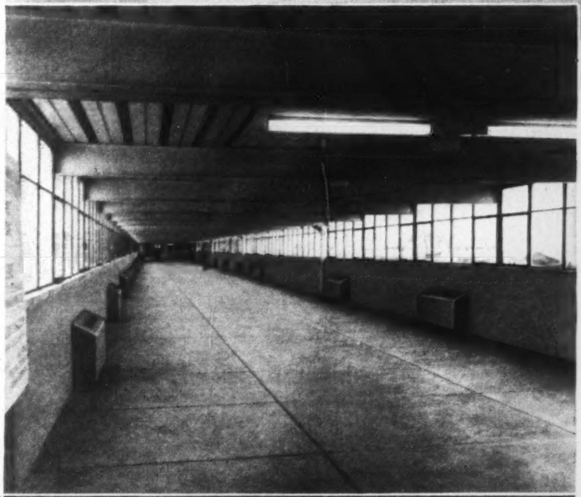
Caterpillar Tractor Co. has announced plans to introduce a new gas engine particularly suited to air conditioning applications. These engines may be operated on natural gas or LP gas and may be hooked up in tandem for larger load capacity. According to a Caterpillar executive, their plan is to make these engines available for a major segment of the 150 to 900 ton market.

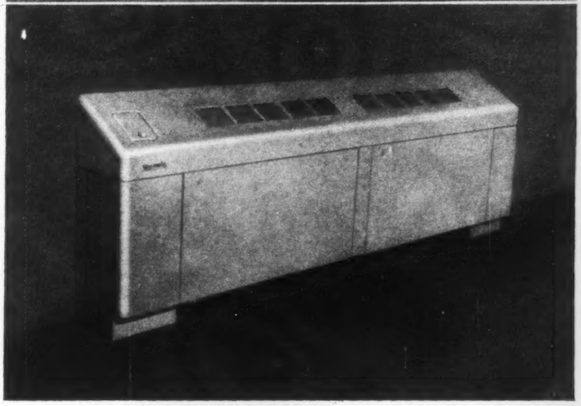
The Robertshaw-Fulton Co. was licensed last year to produce the radically new free-piston engine compressor for air conditioning units. This is expected to be avail-



Marlo adds another touch of comfort to St. Louis' Jet-Age Airport

Lambert Municipal Airport, St. Louis





The administration building at St. Louis Lambert Municipal Airport has taken its place among the world's masterpieces of contemporary architecture.

Airline customers have discovered, too, that this dramatic structure by Hellmuth, Obata and Kassabaum blends modern design with unbelievable convenience and efficiency.

Another touch of comfort was added recently with the year-round air conditioning of the three "fingers", or covered walkways, extending from the main building to areas where planes discharge and take on passengers.

Two hundred and twenty-three Marlo "Seazonaire" remote fan coil units of 300 to 800 cfm were installed by Guaranteed Heating and Engineering Company. Using chilled or heated water from a central source, these compact units provide perfectly conditioned air in summer and winter. Consulting engineers for the installation were Ferris & Hamig.

For further information about practical, efficient "Seazonaire" air conditioning units by Marlo, see the Marlo representative in your area or write to us direct.

Marlo coil co.

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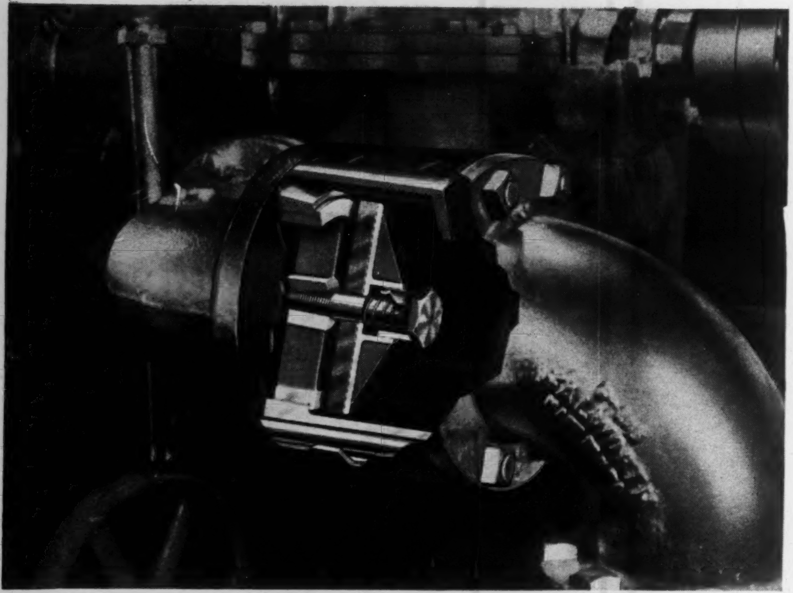

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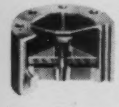
. . . and this non-slam feature is your *positive* assurance of a silent, safer piping system, with protection to the pump, and other equipment.

Easily installed wherever liquid flows, a CPV Check Valve closes automatically as soon as forward flow stops. The valve is closed before any reverse flow occurs. Dangerous line surges and hammer are eliminated without expensive air cushions, shock absorbers and other devices.

Only CPV CHECK VALVES Give You All These Features

- Straight guided disc with two point bearing assures positive valve seating.
- Helical spring is engineered to close automatically as soon as forward flow stops.
- Ideal for all pressures and temperatures—including high temperature water.
- Available in a wide variety of materials, including Alconite, bronze, steel, stainless steel and monel.
- Easily installed in any position.
- Full radial flow with minimum head loss.
- Approved by Factory Mutual Laboratories for fire lines.
- Choice of four basic types in sizes from ½-in. to 18-in. or more.

Get the full story about CPV Silent, Non-Slam CHECK VALVES. Write today for Catalog C.



STYLE G . . . 2-10"

STYLE GB . . . 6-18"+

STYLE NU . . . ½-2"

STYLE H . . . ½-2"

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COMBINATION PUMP VALVE CO.

851 PRESTON STREET • PHILADELPHIA 4, PA.

SOLD BY RELIABLE AGENTS IN PRINCIPAL CITIES

1960: a year of promise

(Continued from page 352)

able soon and will be adaptable particularly to relatively small tonnage installations.

Carrier Corp. is introducing a complete new line of gas air conditioning units up to 1000 tons in capacity according to Mr. Stackpole.

The Trane Co. will be marketing a newly-designed absorption cold generator for air conditioning large buildings, Mr. Stackpole reported. The generator will be powered by low-pressure steam, using water as the refrigerant.

York Corp. will be completing the final development of a gas engine-driven heat pump.

All of these developments in gas air conditioning equipment will give architects and engineers an increased range of choice and flexibility in planning and design.

Coal Sales Continue Rise

In the coal industry, the Anthracite Information Bureau anticipates continued gains in the commercial field. Commercial equipment sales have risen more than 300 percent in the past four years, and several factors are expected to have a favorable influence on future sales. The steady growth installations of automatic equipment holds present tonnage shipments where existing anthracite equipment is replaced. These installations also represent a gain in new large tonnage users when this type of equipment is installed in new buildings.

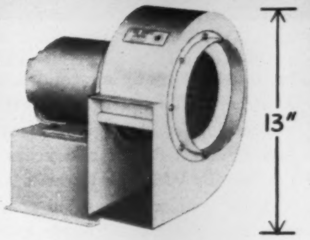
LP Gas Future Optimistic

Within the liquefiied petroleum gas industry, 1960 is expected to show continued increases. According to Howard D. White, executive vice president of the Liquefied Petroleum Gas Association, it is estimated that overall LP gas sales have increased during 1959, 710 million gal or about 9½ percent over 1958's total of 7.4 billion gal

large or small...always specify BARRY for your air moving requirements!

NORT HERN . PACI FIC
6

Ready for shipment (below) are several BARRY 60″ impeller diameter centrifugal fans—each capable of moving over 100,000 cfm.



A BARRY centrifugal fan with a 6″ impeller diameter takes little space, moves up to 500 cfm of air quietly and efficiently.

BARRY

CENTRIFUGAL FANS

Whether your specifications call for centrifugal fans with an impeller diameter as large as 90″, or as small as 6″ . . . there's a BARRY blower that can meet your needs *exactly!* Regardless of size or capacity, every BARRY unit is precision engineered, expertly balanced, and carefully tested and inspected before shipment. Fans are available in all classes from I through IV – and you'll get fast delivery on every order! When you need centrifugal fan equipment with proven efficiency and dependability – *always* specify BARRY!

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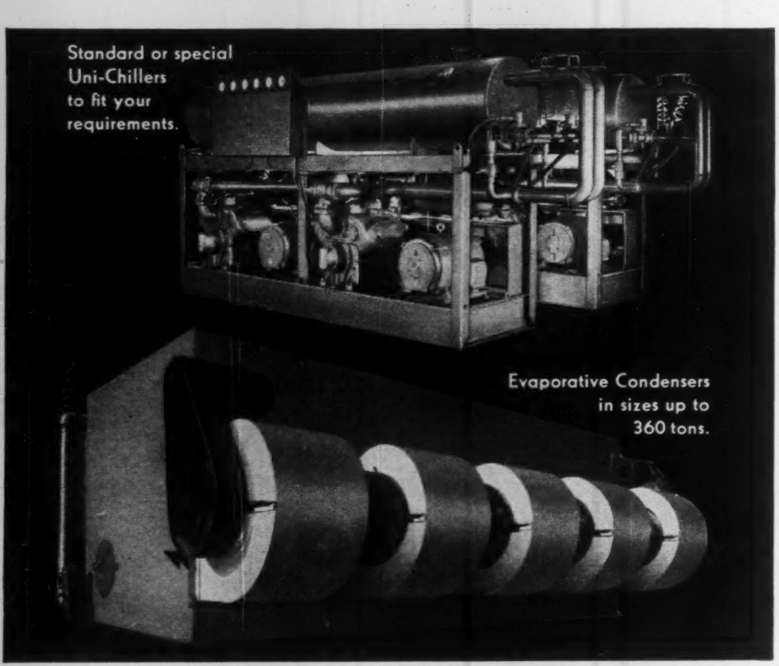
Increased performance and continued lower costs with Vilter Air Conditioning


Standard or special Uni-Chillers to fit your requirements.
Evaporative Condensers in sizes up to 360 tons.

Vilter units for many air conditioning applications are designed to make every dollar count in increased performance, more economical operation, longer life, a more compact installation, and a minimum of maintenance. Years and years of research went into the design of the famous VMC Compressor and Equipment, and this research is continuing at an intensified pace—all aimed at making the VMC Compressor the most durable and efficient on the market.

Uni-Chillers—Each of the special Vilter self-contained units (shown above) consists of two compressors and 75 hp motors, condenser, water chiller and controls. The capacity of each Uni-Chiller is 150 tons. Completely factory-assembled. Compact Uni-Chillers are available in sizes from 10 tons upward.

Evaporative Condenser—The externally mounted fan of the VXF evaporative condenser (shown above) does not handle moist saturated air from the spray chamber—minimizes corrosion and extends fan life. The Evaporative Condenser saves 90 to 95% in water costs. Permits larger compressor installations where water is scarce. Low pumping cost as compared to cooling tower installation. Capacities of 30 through 360 tons.

Why not write to Vilter and see how you, too, can save money on your air conditioning and refrigeration installations.

Vilter® refrigeration air conditioning

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Milwaukee 7, Wisconsin
Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

uni-chillers

Write to Dept. F-906 for helpful Vilter Bulletins on any of the above equipment.

1960: a year of promise

(Continued from page 354)

to a new industry record of 8.2 billion gal. This represents a 100 percent increase in sales within 8 years.

The 1960 sales estimates point to a further substantial increase (about 7½ percent) to another record of 8.8 billion gal, according to Mr. White.

OHI Jubilee Year in '60

Mr. R. H. L. Becker, managing director of the Oil Heat Institute of America, Inc., expects that 1960 will be a notable year in the oil heating industry. The Oil Heat Diamond Jubilee will be in 1960.

Engineers Play Vital Role

"Professional engineers will necessarily continue to play a vital role in designing improved products and applying those products for the betterment of the public in the year ahead." This is the opinion of Paul H. Robbins, executive director of the National Society of Professional Engineers. Mr. Robbins also states that, "While it is difficult to pin-point the estimate to which building construction may be expanded in 1960, a look at population figures indicates that for the next several years the need for housing, office and commercial construction will continue to be a paramount factor of our economy. It is a well known fact that the building industry now ranks as the largest single factor of our economy; and the housing of people, whether it is for their residence or for their working conditions, requires conditions of comfort which will be most helpful and healthful to their lives and productive abilities. To a large degree, this will be supplied by the extent to which engineers are able to apply their design skills to products and applications, a sizable portion of which will be in the heating, piping, and air conditioning field." ‡

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Information on the purpose, cost, design, operation and maintenance of process and comfort air conditioning systems in manufacturing plants of many kinds. The combined knowledge and experiences of 33 prominent engineers, every one a designer or in direct charge of the largest factory air conditioning systems in operation. This shows other engineers how air conditioning helps speed production, improve products, and increase workers efficiency . . . also how to operate conditioning systems as economically as possible. If improvements and savings in any plant's air conditioning operations are possible, these data and ideas from other plants will certainly suggest the ways to make them. 186 pages, 8½" by 11", **$1.50.**

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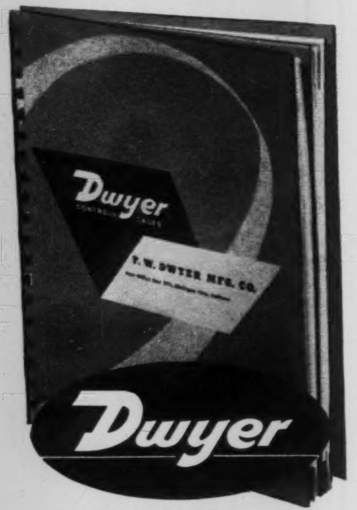

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▶ *AIR CONDITIONING CONTROLS*—including hermetically sealed overheat protectors for single and three-phase compressor motors, hermetically sealed thermostats for compressor motor winding use, and supplementary overloads for line current sensing; folder "SP-12" also contains information on compressor motor starting relays and commercial thermostats for operating and limiting applications. *Texas Instruments Inc., Metals & Controls Div.*, 34 *Forest St., Attleboro, Mass.*

▶ *AIR CONDITIONING EQUIPMENT*—listed in bulletin "80-F" includes compressors, air handling units, control equipment, valves and fittings, industrial processes; also includes tables on properties of brines, saturated ammonia and refrigerant 12. *Frick Co., Waynesboro, Pa.*

▶ *AIR MIXING UNITS*—for different types of buildings and zoning arrangements contained in bulletin "DD-6"; also includes performance data, specifications, dimensions of systems. *Buensod-Stacey, Inc.*, 45 *W.* 18*th St., New York* 11.

▶ *AUTOMATIC BOILERS*—for commercial and industrial applications detailed in catalog "6260"; catalog covers line of oil burners, gas burners, dual-fuel burners for gas and oil, coal stokers, forced draft package units, boiler-burner units, combustion control panels. *Iron Fire-*

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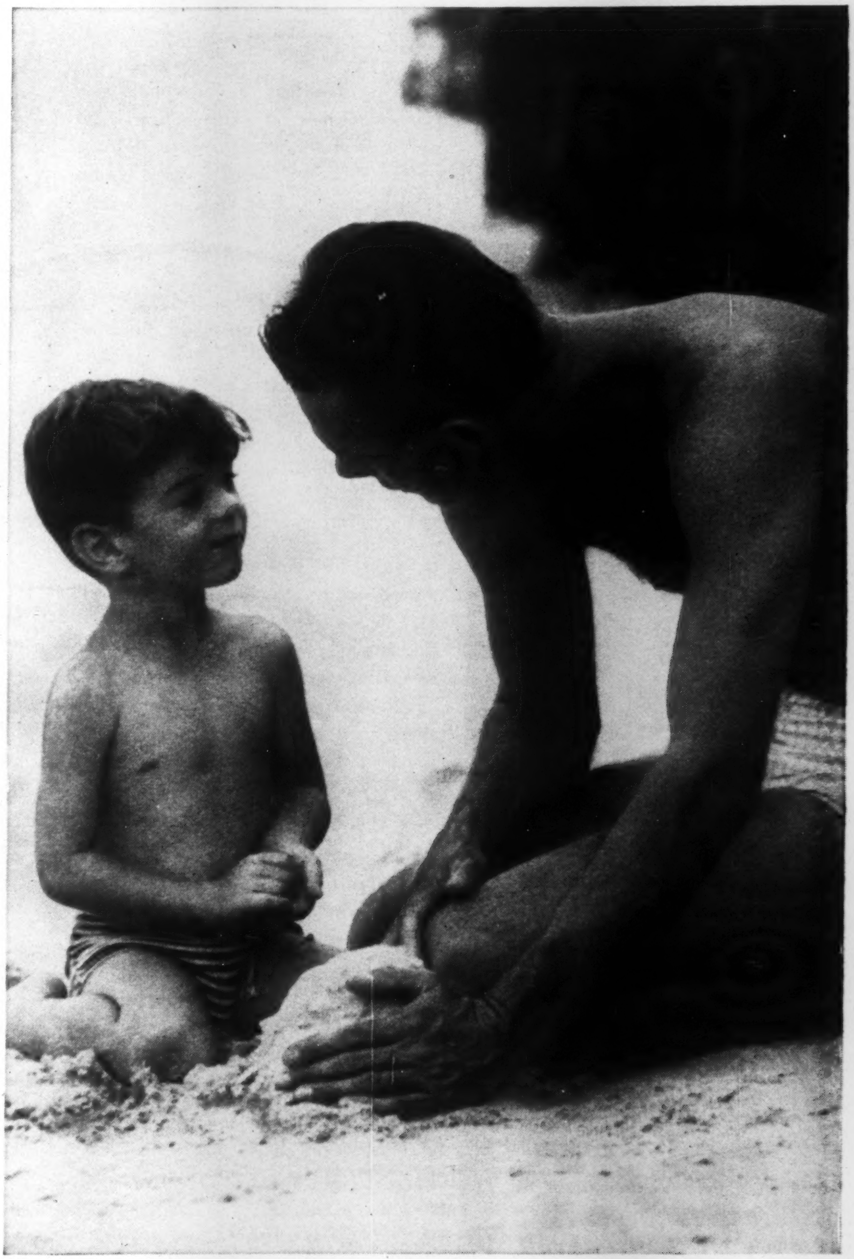

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▶ *DUST SAMPLING*—pamphlet available discussing methods of collecting and measuring aerosols and dusts from ducts and stacks; also presents detailed instructions on standard methods for evaluating dust concentrations in work areas. *Gelman Instrument Co., P.O. Box* 86, *Chelsea, Mich.*

▶ *EXPLOSION-PROOF CONTROLS*—indicating, non-indicating, and recording described in new booklet "1122"; presents controls available in wide variety of temperature ranges up to 1100 F. *Partlow Corp.*, 531 *Campion Rd., New Hartford, N.Y.*

▶ *BALL VALVES*—for applications in pulp and paper mills detailed in new brochure; includes case histories of ball valve in use and lists over 40 additional applications; includes specifications and dimensions from ¼ to 10 in. *Jamesbury Corp.*, 148 *New St., Worcester, Mass.*

▶ *BOILER GASKET LEAKAGE*—and their causes discussed in technical paper "139"; includes facts to help minimize problem. *Betz Laboratories, Inc., Gillingham & Worth Sts., Philadelphia* 24, *Pa.*

▶ *BRASS PIPE FITTINGS*—including those for air conditioning units, gas burners and bottled-gas, oil burners contained in catalog "60-2" which contains indexed specifications. *Brabant Brass Mfg. Co.*, 8925 *Knox Ave., Detroit* 11, *Mich.*

▶ *BRAZING ALLOYS*—for copper, bronze or brass discussed in new booklet; includes complete specifications, cooling charts on standard alloy compositions for non-ferrous brazing and similar data on silver solders for both ferrous and non-ferrous metals. *Alloy Specialties Co., Swissvale, Pittsburgh* 18, *Pa.*

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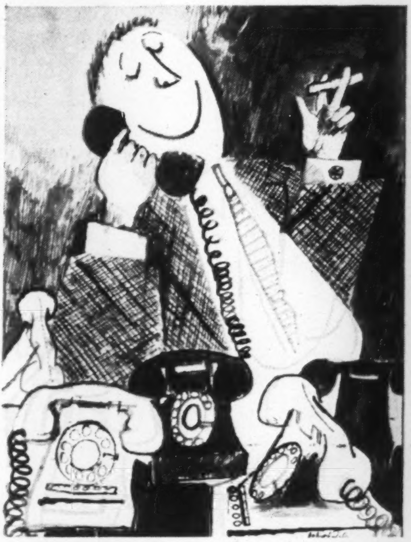

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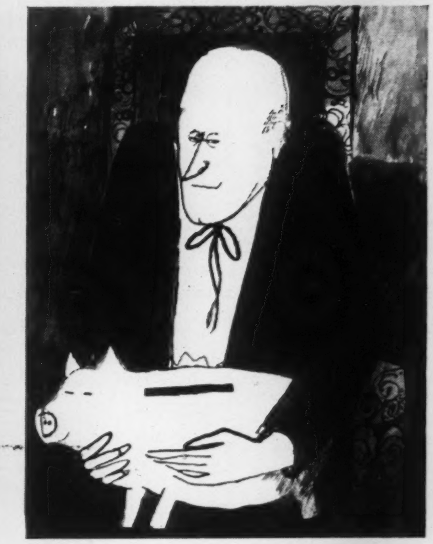

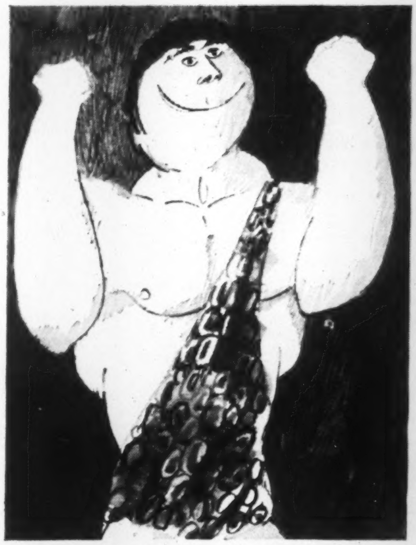

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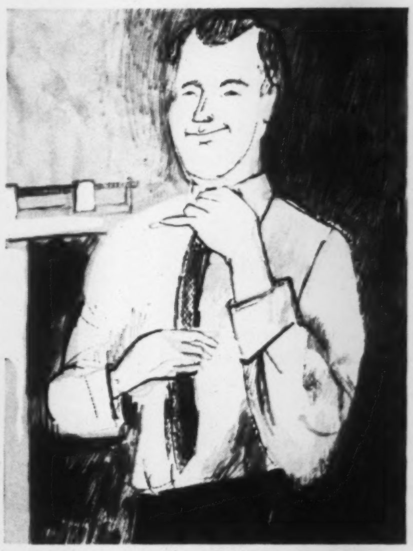

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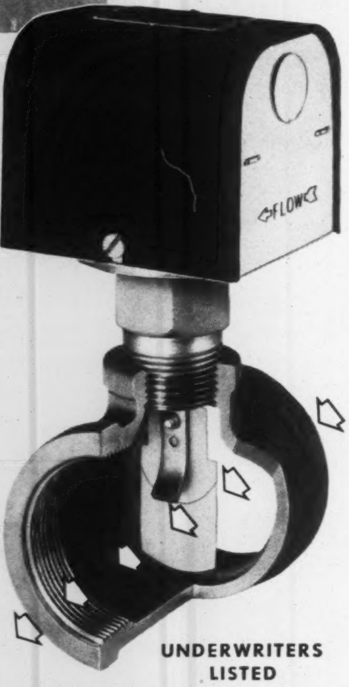

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to start or stop automatic burners—start a booster heater when water draw occurs, stop burner if flow is improperly retarded; make sure of circulation in a boiler before burner is permitted to start.

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FS4—Closes with flow; opens with no flow.

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▶ *BUTTERFLY VALVES*—designed to mount between pipe flanges with tight shutoff at pressure differential of 150 psi; bulletin "10DG" contains complete specifications, dimension drawings, water flow data, gas flow data. *Henry Pratt Co.,* 319 *W. Van Buren St., Chicago* 7.

▶ *CAPACITORS*—for motor-start service detailed in bulletin "GEA-7040"; bulletin gives microfarad ratings, dimensions, case styles, terminal information, application data. *General Electric Co., Schenectady* 5, *N.Y.*

▶ *COUPLINGS*—bulletin "60" includes new style applications, special couplings designed for specific conditions; contains diagrams and tables for each type of coupling. *Thomas Flexible Coupling Co., Main Ave. & Biddle St., Warren, Pa.*

▶ *DRAIN VALVES*—designed for filter plant service detailed in bulletin "W-18" illustrated in typical installation arrangement; also includes charts of dimensions, parts list keyed to diagrams of valves. *Golden-Anderson Valve Specialty Co.,* 1210 *Ridge Ave., Pittsburgh* 33, *Pa.*

▶ *FLOW INDICATOR*—featuring integral by-pass design described in specification sheet "DS-132"; includes capacities, ratings. *Brooks Rotameter Co., Hatfield, Pa.*

▶ *FLOW INDICATOR*—for purge type service detailed in specification sheet "DS-130-1"; includes illustrations of flow indicators with single and double alarm contact. *Brooks Rotameter Co., Hatfield, Pa.*

▶ *HEAT EXCHANGERS*—for special application to process industry detailed in new manual "10647"; included are sections on design and components, technical design check

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lists, data sheets, tables, graphs. *Patterson-Kelley Co., Inc., Process Heat Exchanger Div., East Stroudsburg, Pa.*

▶ *INDUSTRIAL WASTES*—and their treatment through instrumentation discussed in bulletin "B97-2"; included are case histories of how instruments are applied to industrial waste treatment systems to prevent stream pollution. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Ave., Philadelphia 44, Pa.*

▶ *INFRARED HEATING*—for industrial and commercial buildings discussed in bulletin "PE1-59-5-1"; bulletin includes formulae and equations for calculating infrared requirements; includes heat transfer co-efficients, gas pipe capacities, conversion tables. *Bettcher Mfg. Co., 3106 W. 61st St., Cleveland, O.*

▶ *INSULATION MATERIAL*—of expanded polystyrene detailed in new brochure; includes description of physical properties, dimensions, recommended thicknesses for wide range of temperature conditions, specifications for various applications. *Uni-Crest Div., United Cork Cos., Dept. P, 1 Central Ave., Kearny, N.J.*

▶ *ISOMETRIC TEMPLATES*—for tri-temp indirect hot water supply systems with vertical or horizontal tanks detailed in engineering bulletins Nos. "26 through 30"; include complete dimensional data, specifications of tanks, coils, pumps, controls accessories, water piping details, gas piping and vent size. *Raypak Co., Inc., 2416 Chico Ave., El Monte, Calif.*

▶ *OIL HEATER*—specification sheet "O-32" describes fuel oil protection

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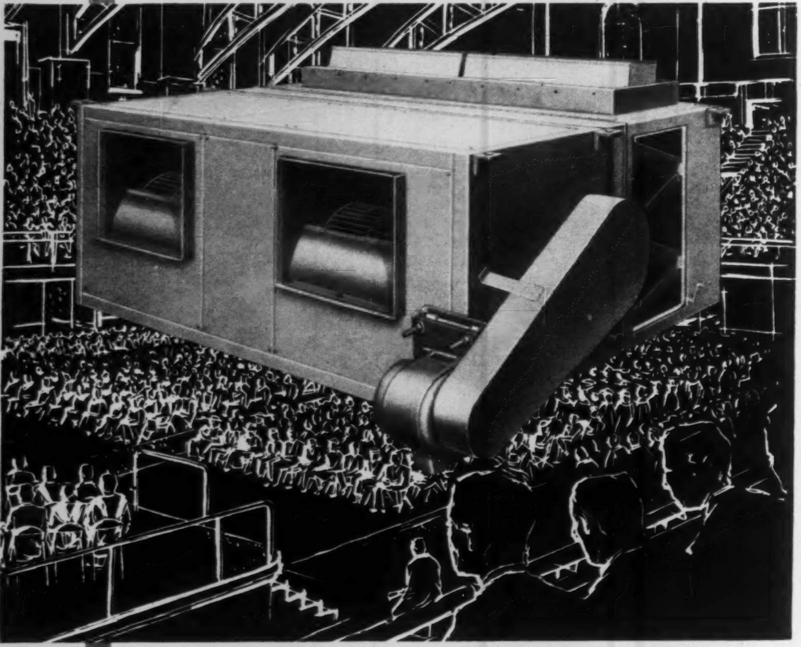

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heater for below water line application; contains details of construction, installation instructions, capacities and dimensions. *Yula Corp.*, 330 *Bryant St., New York* 59.

▶ *PACKAGE BOILERS*—ranging from 15 through 600 hp sizes detailed in new bulletin "BE-400"; contains design specifications, applications, tabular information on each model. *Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.*

▶ *PACKAGED DEMINERALIZER*—in capacities from 2100 to 13,200 gph using raw water with 10 grains per gal total exchangeable anions detailed in brochure "4.46"; includes specifications, installation procedures. *Cochrane Corp., 17th St., Below Allegheny Ave., Philadelphia 32, Pa.*

▶ *PIPE ALIGNMENT GUIDES*—in bulletin "1960"; includes table showing recommended spacing, complete specifications, diagrammatic illustrations. *Align-O—Pipe Guide Co.*, 55 *Beaver Drive, Barrington, N. J.*

▶ *PIPE CONNECTIONS*—for hydraulic and pneumatic systems described in bulletin "6170"; includes detailed specifications, size range, installation instructions. *Weatherhead Co., Fort Wayne Div.,* 128 *W. Washington Blvd., Fort Wayne, Ind.*

▶ *PIPE FASTENERS*—for electrical, hydraulic, pneumatic lines of ¼ to 6 in. detailed in bulletin "TA209G"; includes engineering drawings, other suggested uses. *TA Mfg. Corp.,* 4607 *Alger St., Los Angeles* 39, *Calif.*

▶ *PLASTIC PIPE*—detailed in new folders: AP(PL) 1, AP(PL) 2, AP(PL) 3, AP(PL) 4; includes information on applications of 10 and 20 ft lengths of pipe as well specifica-

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▶ *PVC PIPE EXTRUSIONS*—guide available including sections on PVC part design, factors in selecting PVC; *Alpha Plastics, Inc., Okner Parkway, Livingston, N.J.*

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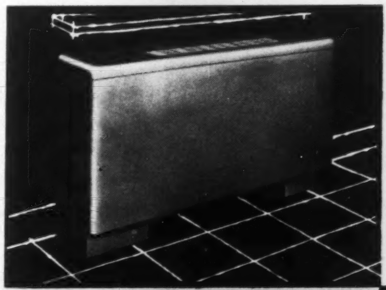

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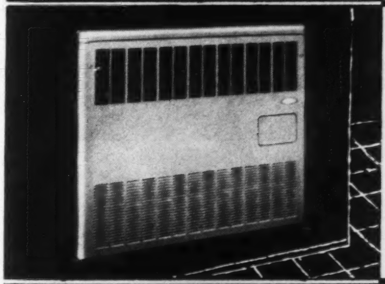

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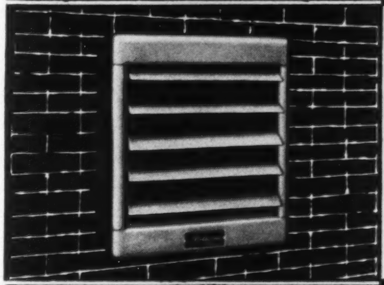

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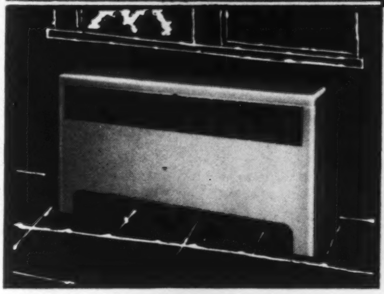

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▶ *RADIANT HEATERS*—providing direct spotted heat without heating adjoining areas described in new brochure; contains specifications for gas fired heaters as well as layout and design calculation chart. *Solarflo Div., Ogilvie & Vaskov Engr. Co., 411 S. Vermont Ave., Glendora, Calif.*

▶ *RATCHET WRENCH*—catalog "62" contains full specifications for complete line; also includes simplified method for figuring correct wrench sizes for any bolt or nut. *Lowell Wrench Co., 54 Commercial St., Worcester 4, Mass.*

▶ *RIVET SELECTION*—pocket-size slide chart gives complete specifications for three basic tubular rivets; schematic design charts for truss head, oval head. 20 rivet sizes are covered. *Townsend Co., Engineered Fasteners Div., Box 71-Z, Ellwood City, Pa.*

▶ *SEAL-LESS PUMPS*—for leakproof pumping covered in bulletin "1100"; includes design features, operation, selection of proper "canned" pump. *Chempump Div., Fostoria Corp., P.O. Box 35-7, Huntingdon Valley, Pa.*

▶ *SEAMLESS TUBING*—selection discussed in folder "TDC-193"; includes description of two steels suitable for such applications; general characteristics and technical data on both grades discussed. *Babcock & Wilcox, Tubular Products Div., 712 Eleventh St., Beaver Falls, Pa.*

▶ *SOLDERS, FLUXES*—for soldering applications detailed in catalog "C-1"; includes general purpose, stainless steel, aluminum, resin and non-corrosive fluxes, paste solders, tinning compounds, silver brazing fluxes, aluminum and stainless steel

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solders, soldering accessories. *Johnson Mfg. Co., Inc., Mt. Vernon, Iowa.*

▶ *SPLIT CASE PUMPS*—in sizes from 1½ through 4 in. discharge and in packed type through 8 in. described in bulletin "B-2100"; bulletin includes dimensions, capacities and head ranges, applications, performance data. *Peerless Pump Div., Food Machinery and Chemical Corp.*, 2005 *Northwestern Ave., Indianapolis, Ind.*

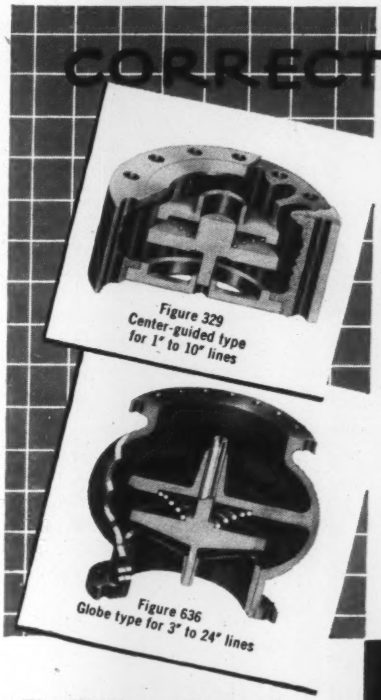
▶ *STEAM AND HOT WATER GENERATORS*—detailed in new brochure No. "35"; steam generators available in 18 sizes from 15 to 750 hp; package hot water generators available in 10 sizes from 670,000 to 6.7 million Btu per hr; includes specifications for all models. *Cyclotherm Div., National-U. S. Radiator Corp.*, 157 *E. First St., Oswego, N. Y.*

▶ *STEAM TRAPS*—detailed in new "Primer" booklet; included are facts on condensate drainage, and all types of traps. *Barnes & Jones, Inc.*, 34 *Crafts St., Newtonville* 60, *Mass.*

▶ *STRESS RELIEVING WELDED JOINTS*—portable induction heating equipment explained in folder "DM-117" including principle of high frequency induction heating; also details unusual stress relieving jobs accomplished with induction heating equipment. *Hobart Brothers Co., Hobart Square, Troy* 1, *O.*

▶ *TEMPERING VALVES*—to proportion both hot and cold water described in new bulletin "TV-5"; includes engineering features and installation diagrams for seven tempering valve sizes in range from ¾ through 3 in. *Lawler Automatic Controls, Inc.*, 453 *N. MacQuesten Pkwy., Mt. Vernon, N. Y.*

▶ *THERMAL ELEMENTS*—of disc type detailed in new booklet "SP-10"; describes how disc actuates ther-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Center-guided type for 1" to 10" lines

Figure 636
Globe type for 3" to 24" lines

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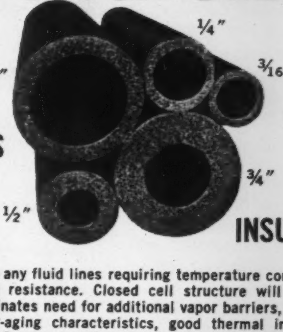

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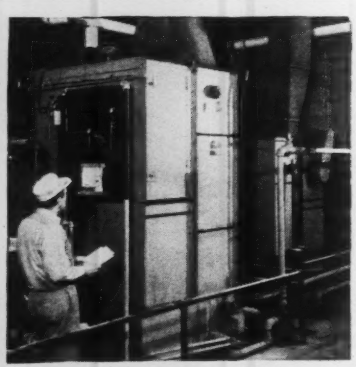

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mostats, circuit breakers, inherent overheat motor protectors; also includes other controls not disc-actuated. *Texas Instruments, Inc., Metals & Controls Div., 34 Forest St., Attleboro, Mass.*

▶ *THERMOCOUPLES*—for high pressure, high velocity steam temperature measurement described in specification "S 001-la"; includes graph to aid in selection of proper well design and material. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*

▶ *URETHANE FOAMS*—with fluorinated hydrocarbons detailed in brochure "IR-229 25C"; includes typical applications, contains chart comparing physical properties of insulating materials. *Isotron Dept., Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Pa.*

▶ *VALVES*—catalog "60" features 24 page valve selector and over 100 pages of engineering data; complete line of steel, iron, bronze, plastic valves presented along with specifications, illustrations on lubricating devices, boiler mountings, cocks and other products. *Lunkenheimer Co., Waverly & Beekman Sts., Cincinnati 14, O.*

▶ *VALVES*—booklet containing technical data, construction details for relief valves, shutoff valves, plug valves, custom valves, now available; includes dimensions, materials, operating principles. *Circle Seal Products Co., Inc., 2181 E. Foothill Blvd., Pasadena, Calif.*

▶ *VALVES, FITTINGS*—for air conditioning industries applications described in catalog "R-7"; contains detailed information on sizing and application of valves and components as well as data on working pressures and descriptions of codes and regulations to which products are manufactured. *Superior Valve & Fittings*

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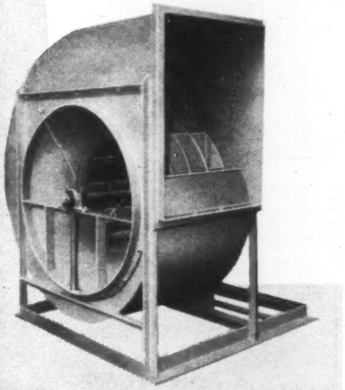

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Co., 1509 *W. Liberty Ave., Pittsburgh* 26, *Pa.*

▶ *VENTILATOR CONTROLS*—for unit ventilators described in new performance test report; test was recorded at school, report contains complete performance charts, test conditions. *Barber-Colman Co.,* 1701 *Rock St., Rockford, Ill.*

▶ *WARM AIR HEATERS*—for gas, oil or combination gas-oil firing shown in bulletin "30-C-43"; contains complete specifications and dimensions as well as typical installations. *Wanson Corp., Lewistown, Pa.*

▶ *WATER HEATER*—catalog available illustrating gas and oil-fired units; includes capacity and dimension charts for 14 sizes; has comprehensive diagrams showing water heater piping as well as longitudinal front and back views. *Portmar Water Heater Co.,* 193 *Seventh St., Brooklyn* 15, *N. Y.*

▶ *WATER SOFTENERS*—for more frequently used zeolite materials, both siliceous and non-siliceous described in booklet "4520" which gives information on selecting and sizing equipment and contains illustrations and cut-way drawings of typical treatment systems. *Cochrane Corp.,* 17*th St. Below Allegheny Ave., Philadelphia* 32, *Pa.*

▶ *WATER TREATMENT*—for heating and cooling systems detailed in technical paper "138"; study reports how sewage plant effluent can be used satisfactorily by recirculating in cooling systems and as boiler make-up. *Betz Laboratories, Inc., Gillingham & Worth Sts., Philadelphia* 24, *Pa.*

▶ *WELDERS*—and other welding products described in new booklet; also includes detailed illustrated company history. *Miller Electric Mfg.*

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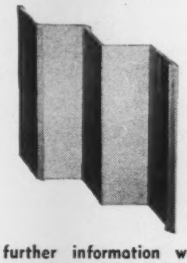

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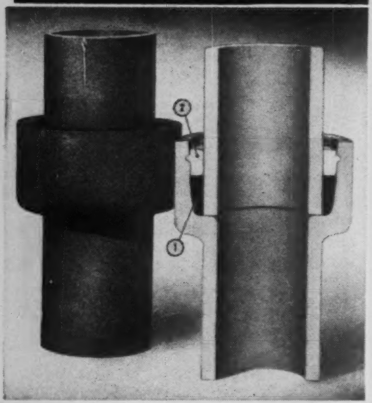

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*Patent Applied For

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Co., 718 S. Bounds St., Appleton, Wisc.

▶ *WELDING ALUMINUM*—chart series includes psi tensile strength, recommended joining material, percent elongation and typical uses shown for 24 aluminum alloys. *All-State Welding Alloys Co., Inc.*, 249-55 *Ferris Ave., White Plains, N. Y.*

▶ *WELDING CABLES*—bulletin "CC-59" titled "Causes and Cures for Hot Running Welding Cables and Connections" now available; includes rules to follow for current efficiency. *Tweco Products, Inc., P. O. Box* 666, *Wichita* 1, *Kansas.*

▶ *WELDING ELECTRODE SELECTION*—16 mm motion picture covers base metal identification, welding currents, welding positions, thickness and shape of base metal to be welded, joint design and fit-up, service conditions; reservations for showing film must be made. *Hobart Brothers Co., Hobart Square, Troy* 1, *O.*

▶ *WELDING EQUIPMENT*—covered in new catalog "F-8982E" available; illustrates all manual torches, accessories are listed in tabular form. *Linde Co.*, 30 *E. 42nd St., New York* 17.

▶ *WELDING FITTINGS*—and flanges in 30 in. nominal pipe sizes detailed in technical bulletin "FDC-274"; includes description, dimensions, weights for fittings. *Babcock & Wilcox Co., Tubular Products Div.*, 712 *Eleventh St., Beaver Falls, Pa.*

▶ *WELDING SYMBOLS*—contained in bulletin "1100.1"; includes charts and illustrations providing information on application of welding symbols and other basic design data. *Lincoln Electric Co.*, 22801 *St. Clair Ave., Cleveland* 17, *O.* ‡

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▶ *ARKLA AIR CONDITIONING CORP.*—Russell Lloyd Brown, manager, heating and air conditioning products.

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▶ *BLACK & DECKER MFG. CO.*—John M. Fox, director of manufacturing; Thomas M. Griffith, director of quality control.

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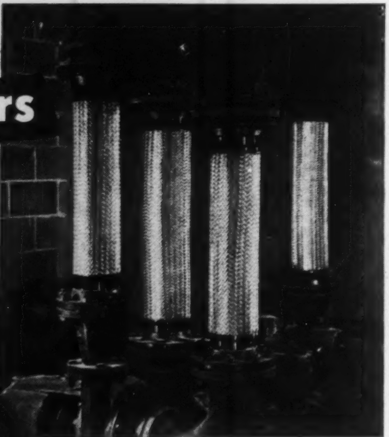

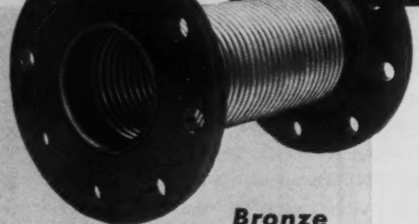

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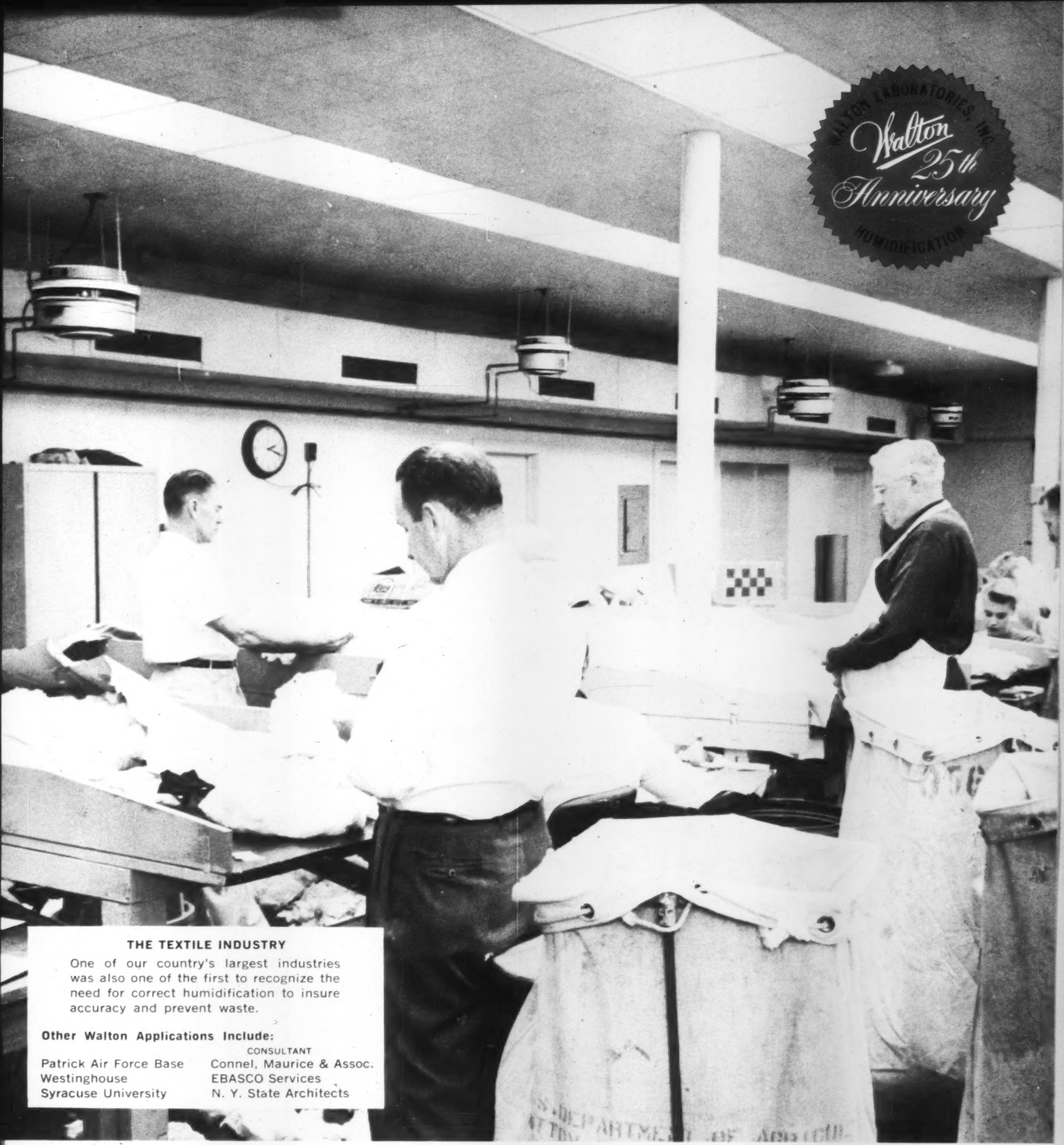

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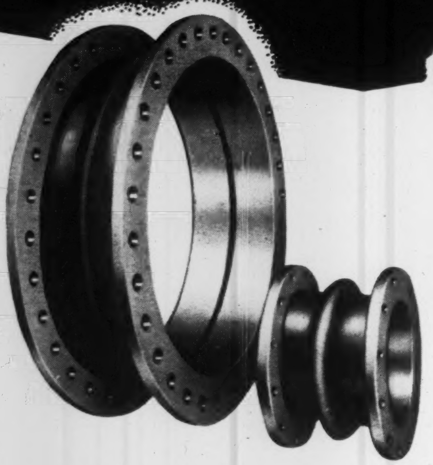

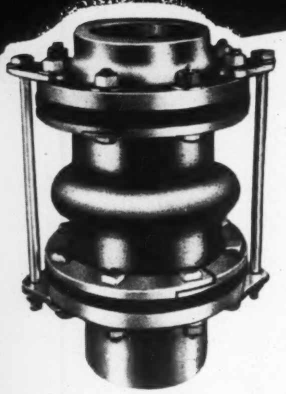

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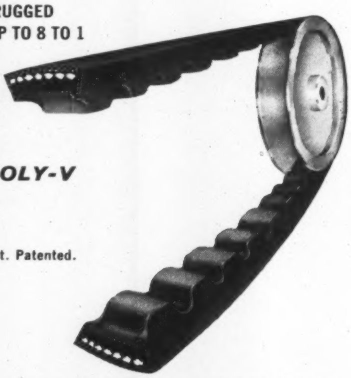

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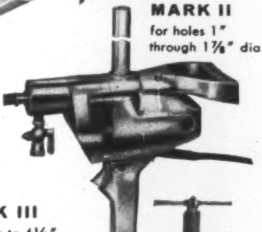

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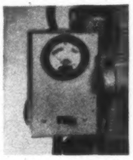

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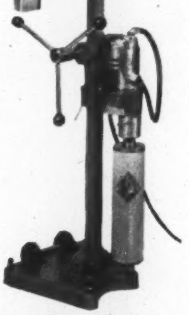

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hydraulic-powered

DIAMOND CORING MACHINE

and Mobile "Thinline" Oriented Diamond Bits

FASTER
SAFER
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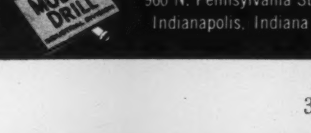
DUST-FREE
PORTABLE

EASIER TO OPERATE
MORE ECONOMICAL

DRILLS VERTICALLY – DRILLS HORIZONTALLY



Write for bulletin on MARK IV and complete Mobile line of Diamond Masonry Coring Machines and "Thinline" Oriented Diamond Bits . . .

MOBILE DRILLING, INC.
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Indianapolis, Indiana

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LO-BOY

CENTRIFUGAL ROOF EXHAUSTERS

Enhance the Beauty of Building Skylines

Pats. Pend.

Lowest Silhouette Design

Forward or Backward Curve Wheel Within . . . . or Out of Scroll Housing

Motor mounting on side of structure support . . . out of line of air stream reduces height of Lo-Boy models nearly 50% of older designs.

LOW WIND RESISTANCE
SIZES 10"-72" 600-47,000
CERTIFIED C.F.M. RATINGS

- QUALITY ● BEAUTY
- PROVEN PERFORMANCE

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AMMERMAN CO., INC.

P.O. Box 182
Stillwater, Minnesota
MEMBER OF THE AIR MOVING & CONDITIONING ASSN.

WHO'S WHAT

Continued

▶ *GRAVER WATER CONDITIONING CO.*—Marvin Lane, general manager.

▶ *MILTON ROY CO.*—Earl J. Serfass, vice president in charge of research and development and a member of board of directors.

▶ *JOSAM MFG. CO.*—M. J. Hirshstein, president; A. L. Yeager, vice president in charge of manufacturing; Lewis H. Polster, vice president in charge of sales.

▶ *PERMAGLAS DIV., A. O. SMITH CORP.*—Walter M. Harris, controller; Robert M. Timmerman, manager of materials; Howard D. Tomas, manager of industrial relations.

▶ *KEASBEY & MATTISON CO.*—Andrew C. Richardson, merchandising manager, sprayed asbestos; William H. Mackey, merchandising manager, asphalt products dept.; Louis Voges, project engineer, central engineering dept.

▶ *SPECIALTY BLOWER DIV., TORRINGTON MFG. CO.*—Adam M. Wilczenski, manager, technical services.

▶ *JOHNS-MANVILLE FIBER GLASS, INC.*—Francis H. May, Jr., elevated to full responsibility for administration; Mr. May replaces Randolph H. Barnard who recently resigned as president; Mr. Barnard will continue with Johns-Manville in an advisory capacity.

▶ *CLEVELAND BETTER HEATING-COOLING COUNCIL*—president: Harry C. Richardons, Maurer Bros. Co.; 1st vice president: John Wallace, American-Standard; 2nd vice president: William Hauck, Rex Pipe Supply Co.; secretary: Ellsworth Hann, V. & E. Hann, Inc.; Louis C. Oswald, treasurer.

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FLUID LEVEL ● FLOW

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EXPLOSIVE FLUIDS or VAPORS
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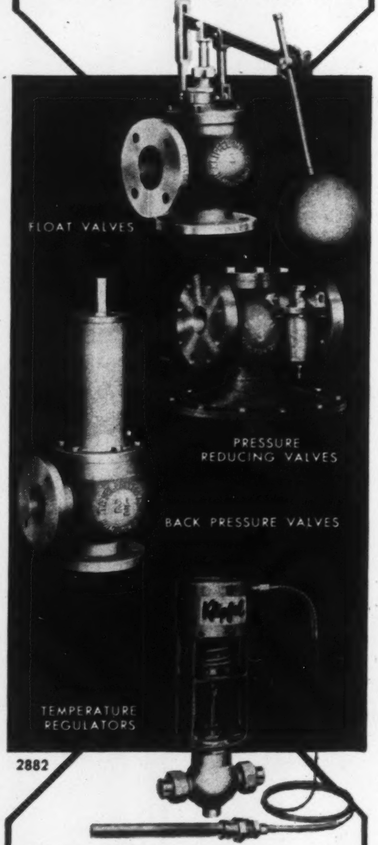

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ENGINEERING

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VALVES INCORPORATED
1070 LINCOLN AVENUE
HAMILTON, OHIO
A DIVISION OF THE HAMILTON-THOMAS CORPORATION

WHO'S WHAT

Continued

▶ *CONTROLS CO. OF AMERICA*—R. W. Sloane, director of engineering-heating and air conditioning controls; R. E. Law, product manager-oil heating products; Harvey B. Wilgus, asst. director of sales.

▶ *CLEAVER-BROOKS CO.*—Donald W. Mattimore, supervisor of water tube boiler erection for Springfield Boiler Co. subsidiary.

▶ *MIDLAND-ROSS CORP.*—Henry M. Heyn, vice president in charge of Surface Combustion Div.; Robin A. Bell, vice president in charge of Janitrol Heating and Air Conditioning and Janitrol Aircraft Divs.; Eugene P. Heiles, vice president of Surface Industrial Div.; Robert J. Jacobs, vice president in charge of Waldron-Hartig Div.; C. J. Schmidt, vice president.

▶ *TUBE MANIFOLD CORP.*—John D. Amoroso, plant manager.

▶ *MINNEAPOLIS - HONEYWELL REGULATOR CO.*—Douglas K. Ridley, contract sales manager.

▶ *TRANE CO.*—Sam H. Harper, Jr., sales engineer.

▶ *BLACK & DECKER MFG. CO.*—Harry L. Williamson, Jr., vice president and general manager of Master Power Corp. subsidiary.

▶ *VIKING AIR PRODUCTS DIV., NATIONAL-U.S. RADIATOR CORP.*—John A. Green, general sales manager.

▶ *REYNOLDS METALS CO.*—Ralph F. Thompson, Jr., manager of appliance and equipment market.

Individual Fin Tubing
Square Fin, Continuous, Return Bend Coil
Square Fin, U-Bend Tubing
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FINNED TUBING
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★ known for performance since 1915 ★

- Tubes & Coils
- Individual finned tubing in standard sizes, square or round fins of any height or spacing
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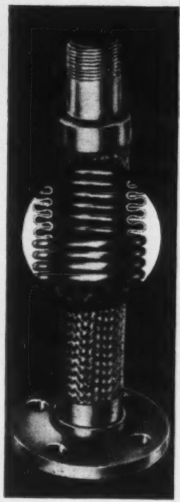

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☐ Vibration Tamers
☐ I am particularly interested in Allied Flexible Metal Hose for

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TITLE ....
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▶ *PLUMBING-HEATING-COOLING INFORMATION BUREAU*—chairman of executive committee: Lee Martin, president, NIBCO, Inc.; chairman of finance committee: John M. Dumser, director of sales, Wolverine Tube, Div. of Calumet & Hecla, Inc.; chairman of membership committee: John E. Sommers, president, Noland Co.; president: William A. Fitzpatrick, general manager, M. J. Gibbons Supply Co.; vice president: Lee Martin, president, NIBCO, Inc.; treasurer: John M. Dumser, director of sales, Wolverine Tube, Div. of Calumet & Hecla, Inc.; secretary: Norman J. Radder; executive director: Norman Wicks.

▶ *INGERSOLL PRODUCTS DIV., BORG-WARNER CORP.*—M. R. McLary, executive vice president and manager; Howard A. Schmeal, vice president, treasurer, secretary; J. R. Madigan, senior scientist; Blaz A. Lucas, Jr., vice president in charge of sales.

▶ *PARAGON ELECTRIC CO.*—Howard M. Bucholz, manager, commercial time switch division.

▶ *STRONG, CARLISLE & HAMMOND*—Joseph P. Stroz, chief engineer.

▶ *A. O. SMITH CORP., PERMAGLAS DIV.*—Milton E. Morgan, vice president. Milo Miller, assistant vice president.

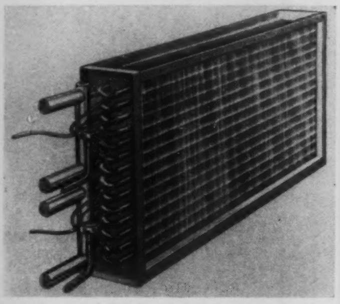
▶ *METREX VALVE CO.*—Bernard E. Konopka, eastern division manager and sales manager.

▶ *DOLE VALVE CO.*—J. K. Lund, vice president, research and development division.

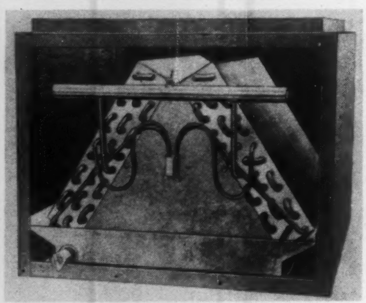
▶ *CLAY FLUE LINING INSTITUTE*—president: James L. Clough, Evans Brick Co.; vice president: A. R. Thorson, Mill Hall Clay Products, Inc.; secretary: Robert F. Larson, Natco Corp.; treasurer: Philip E. Kopp, Malvern Flue Lining, Inc.

▶ *TUBE TURNS DIV. OF CHEMETRON CORP.*—James M. Gloor, works manager; Morry T. Wakefield, production superintendent; Max B. Densford, personnel manager; Henry H. George, chief engineer; Everett C. Rodabaugh, principal research engineer; Fred C. Smith, director of quality control.

▶ *DUNHAM-BUSH, INC.*—Les Garnsey, secretary.



Horizontal Evaporator
2, 3, 4, 5, 6 & 7½-ton sizes



Furnace Evaporator
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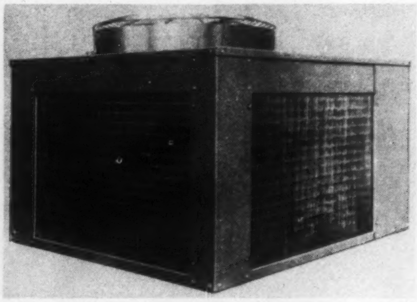

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* Quick delivery FROM STOCK on standard sizes
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* Coils built to your specifications

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WHO'S WHAT

Continued

▶ *ARCRODS CORP.*—H. M. Peterson, vice president and controller.

▶ *BABCOCK & WILCOX CO.*—J. R. Connell, purchasing agent of the boiler division; J. P. Craven, vice president; O. R. Carpenter, assistant vice president, boiler division.

▶ *BROWN FINTUBE CO.*—John W. Nevins, chief engineer.

▶ *AMERICAN GAGE & MACHINE CO.*—William F. Huck, director.

▶ *COOLERATOR DIV. McGRAW-EDISON CO.*—M. F. Beisber, president.

▶ *EMERSON ELECTRIC CO.*—Bernard Purcell, assistant vice president; Don Norton, assistant manufacturing manager and manufacturing engineer; William E. Roof and Burt Lasko, assistant manufacturing engineers.

▶ *AMERICAN-STANDARD, AIR CONDITIONING DIV.*—Clyde H. Wilkinson, president.

▶ *KEASBEY & MATTISON CO.*—Robert S. Hartman, manager, planning and inventory control.

▶ *WILLIAM WALLACE CO.*—Frank Kohles, vice president in charge of sales.

▶ *JOHNS-MANVILLE CORP.*—Don L. Hinmon and R. F. Orth, senior vice presidents.

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The Bettcher Mfg. Corp.
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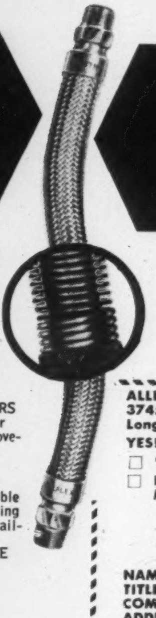

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"MNH" FLEXIBLE CONNECTORS

FROM **STOCK** FOR FASTEST SERVICE

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- **BRONZE**
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THESE STOCK SIZES
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1" 1¼" 1½" 2"

IN THESE STOCK LENGTHS
12" 18" 24" 30"
36" 48" 60" 6 FT.
8 FT. 10 FT. 12 FT. 15 FT.

. . . also available in all standard sizes, in any required length, with any standard or special fitting or flange.

"MNH" FLEXIBLE CONNECTORS Dampen Vibration, Compensate for Misalignment, Permit Offset Movement, Absorb Expansion, Allow "travel," Handle most flexing applications.

ALLFLEX Standard "MNH" Flexible Connectors are sold through leading industrial Distributors. If not Available locally — THEY CAN BE SHIPPED FROM FACTORY SAME DAY ORDER IS RECEIVED.

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ALLIED's new "MNH" in-stock plan assures you SAME-DAY SHIPMENT of the most popular standard "MNH" Flexible Connectors.

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PROMPT, EXPERT ASSISTANCE with your SPECIAL PROBLEMS.

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ADDRESS . . . .
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WHO'S WHAT

Continued

▶ *OIL HEAT COUNCIL*—president: Irving Oelbuam, Liberty Fuel Oil Co.; vice president: Richard Morgan, Nassau Oil Co.; treasurer: Robert Crane, Reel Strong Fuel Co.; secretary: William Sortor, Sunrise Oil Co.

▶ *NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSN.*—president: Harry C. Gurney, Janitrol Heating and Air Conditioning Div., Midland-Ross Corp.; first vice president: Don Winegardner, Majestic Co., Inc.; second vice president: Harold P. Mueller, Jr., Mueller Climatrol Div., Worthington Corp.; secretary-treasurer: James M. Martin.

▶ *ARMCO STEEL CORP.*—Ralph L. Gray, chairman of board, Logan T. Johnson, president.

▶ *NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL*—Federal Construction Council: Francis A. Govan, project director; James R. Smith, staff engineer; Building Research Advisory Board: I. Perry Clark, Jr., project director; Dr. Augustus B. Kinzel, chairman of division of engineering and industrial research.

▶ *CRANE CO.*—Fred D. Crowther, vice president and general manager of Chapman Valve Co. subsidiary.

▶ *SQUARE D CO.*—Robert W. Dunham, chief engineer of molded case circuit breaker div.

▶ *WARREN WEBSTER & CO., INC.*—James K. Campbell, to board of directors.

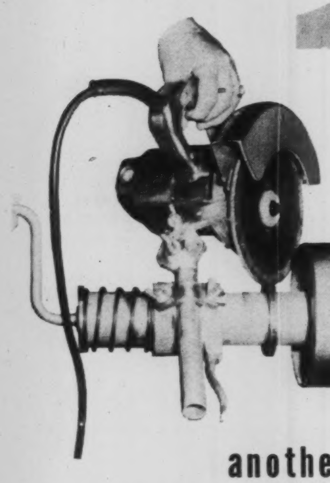
▶ *DRAYER-HANSON DIV. NATIONAL-U.S. RADIATOR CORP.*—Charles A. Hasenstab, purchasing agent.

▶ *NEW YORK CANCER COMMITTEE*—chairman, heating, air conditioning & ventilating div.: August Rust-Oppenheim, president, Anemostat Corp. of America.

▶ *TENNEY ENGINEERING, INC.*—Sid Shapiro, vice president.

▶ *NATIONAL SUPPLY CO.*—Kenneth L. Palmer, advertising manager.

▶ *PANELBLOC DIV., BETTCHER MFG. CORP.*—Paul H. Goodell, chief engineer.



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NEW! H & M "BEVEL-LAND" GRINDER

The new H & M "BEVEL-LAND" GRINDER is designed to eliminate costly hand work by cleaning and smoothing pipe cuts and putting a land on the bevel, preparatory to welding. To assure perfect line-up, the machine employs an electric grinder which automatically smooths and cleans the bevel cuts. The new grinder comes in two models: one for 6" to 14" pipe and one for 14" to 36" pipe.

STANDARD H&M MACHINES
1½" to 36" pipe
The seven models of H & M Pipe Cutting and Beveling Machines are designed to operate with speed and accuracy — in the field or shop.

Improved H & M SHAPE CUTTER
The new lightweight H & M Shape Cutter operates on all H & M machines. Through the use of templets, saddles, tees and els are expertly cut.

Improved H & M OUT-OF-ROUND
The H & M Out-of-Round assures perfect cuts on egg-shaped pipe. A roller rides the surface and keeps the torch the same distance from the pipe at all times.

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Motorized Units
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another FIRST joins the H & M line of pipe cutting and beveling machines

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311 E. Third St. DI 3-0241
TULSA, OKLAHOMA

WHO'S WHAT

Continued

▶ *YORK DIV., BORG-WARNER CORP.*—R. J Halloran and M. S. Lebair, vice president.

▶ *AMERICAN-STANDARD INDUSTRIAL DIVISION*—James W. Hosler, general sales manager; Richard J. Riedl, product manager.

▶ *SIEGLER CORP.*—Robert K. Miller, vice president; A. Henry Casey, director of corporate public relations and advertising.

▶ *CARRIER CORP.*—Dr. Stanley F. Gilman, manager of compressor development for unitary equipment division.

▶ *WESTINGHOUSE ELECTRIC CORP.*—William E. Hoctor, manager of manufacturing.

▶ *PITTSBURGH PLATE GLASS CO.*—Thomas F. Mitchell, flat glass marketing research; Thomas R. Aberant, paint sales market research; Norman F. Heydinger, fiber glass departmental operations; Alvan C. Gross, sales forecasting in glass division; John S. Burns, market research in basic research on pricing policies.

▶ *SCHEMENAUER MFG. CO.*—Edward C. Liebrecht, sales manager.

▶ *SWARTWOUT CO.*—Robert Mueller, assistant treasurer.

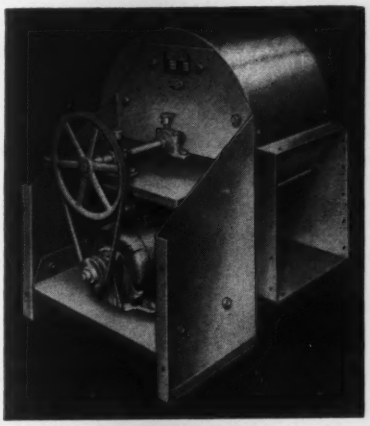
▶ *HOOKER CHEMICAL CORP.*—Arthur P. Schulze, appointed to public relations dept.

IN THE TERRITORIES . . .

(Recent sales appointments)

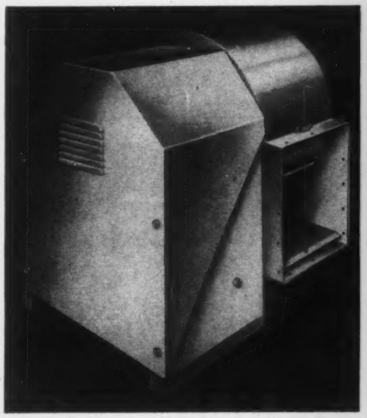
▶ *SLANT/FIN RADIATOR CORP.*—Powell Agencies, representative in Quebec, Canada; Herb Stiner, assistant sales manager covering Long Island and Connecticut.

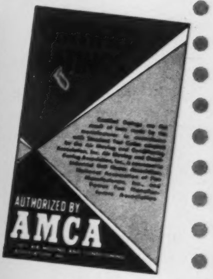
▶ *DODGE MFG. CORP.*—Thomas P. Grace, sales representative for Manhattan, N.Y.



Aladdin
AIR HANDLING EQUIPMENT

UTILITY SETS





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SELF CONTAINED • QUIET OPERATING

ALADDIN Belt-Driven Utility Sets are extremely quiet in operation. Designed for general ventilation, they occupy a minimum of space, handling large volumes of air at low noise levels. They are ruggedly built and are ideally suited for roof installation . . . when furnished with weatherproof cover they require no further protection against the weather.

ALADDIN Utility Sets are available with both forward curved or backwardly inclined blade wheels.

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ALADDIN HEATING CORPORATION
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WHO'S WHAT

Continued

▶ *YORK DIV. BORG-WARNER CORP.*—Stanley J. Graham, central district sales manager; Oliver J. Kesti, manufacturers representative in Michigan, Ohio, Kentucky, Indiana, West Virginia; William H. McCullough, manufacturers representative in northern Illinois, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Wisconsin.

▶ *MUELLER CLIMATROL DIV., WORTHINGTON CORP.*—Jack H. Beck, manager of distributor sales; Leo M. Winter, Manager, dealer sales; Reginald C. Drew, Melvin V. James, W. A. McLemore, regional manager, distributor sales.

▶ *GREENLEE TOOL CO.*—Gene Seymour, covering sales territory in Nebraska, Kansas, Missouri; Bill Farley, sales territory in Arkansas, Louisiana, Mississippi, Alabama; Bill Grasmer, North and South Dakota, Minnesota, northern Wisconsin, Michigan Upper Peninsula, Iowa.

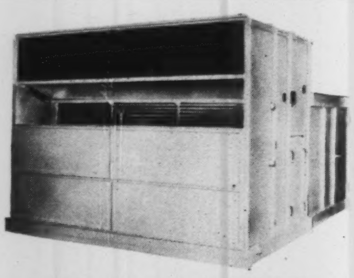
▶ *INLAND STEEL PRODUCTS CO.*—J. T. Barclay, central region sales manager for Chicago, Kansas City, St. Louis, Minneapolis, Milwaukee; M. R. Greene, eastern region sales manager for Baltimore, New York.

▶ *H. B. FULLER CO.*—Ward Oliver, assistant manager for Illinois; Norbert E. Hochreiter, sales manager for New Jersey; Grant V. Disbrow, sales representative in Michigan, Indiana, West Virginia, Kentucky; William D. Dunn, sales representative in Ohio and Louisville, Ky., area.

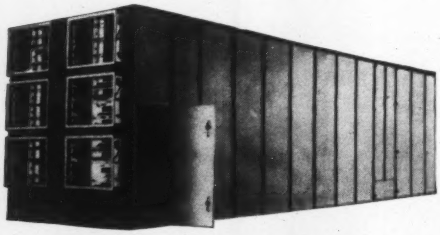
▶ *RUUD MFG. CO.*—J. T. Roberts & Bro. Inc., distributor in Baltimore trading area, eastern Maryland, Delmarva Peninsula; William G. Bennett, representative in Baltimore.

▶ *WORTHINGTON CORP.*—Ramsey, appliance div. of American Factors, Ltd., Von Hamm-Young Co., franchised outlets in Hawaiian Islands.

▶ *FLINTKOTE CO.*—Gerald Gilligan, head of market research dept.; Howard Graham, assistant to head of market research dept.; Tom McDonald, assistant to vice president for sales; H. H. Whittemore, northeastern regional manager; A. P. Noble, southeastern regional manager; G. G. Davenport, southwestern regional manager; C. G. Worley, midwestern regional manager.



DOUBLE DUCT UNITS



MULTIPLE ZONE UNITS

ARTICULATED AIR CONDITIONING UNITS

AIR CONDITIONING EQUIPMENT

A&R

AIR & REFRIGERATION CORPORATION

439 MADISON AVE. • NEW YORK 22, N. Y.

SALES REPRESENTATIVES IN PRINCIPAL CITIES

WHO'S WHAT

Continued

▶ *FAIRBANKS CO.*—John D. Browne, to Cleveland and northern Ohio territory.

▶ *JOHN L. SHANK HEATING EQUIPMENT CO.*—Harold W. Bolin, heading new Evansville, Ind. office; Walter Flower, heading new Jeffersontown, Ky. office.

▶ *MINNEAPOLIS-HONEYWELL REGULATOR CO.*—R. E. Hall, midwest region commercial sales manager; R. K. Ridley, directing contract operations in industrial instrumentation in Philadelphia; Joe Teskoski, branch commercial sales manager, Chicago office.

▶ *ELGEN MFG. CORP.*—W. B. Forrest Co., manufacturers, representative.

▶ *CONOFLOW CORP.*—John M. Vossler & Co., manufacturers' representative in southern California.

▶ *TRANE CO.*—William E. Scollard, manager of branch plants in Scranton, Pa., Clarksville, Tenn., Salt Lake City, Utah; Alvin L. Balzer, sales office, San Francisco; Joseph G. Skach, sales office, St. Paul, Minn.

▶ *TORRINGTON MFG. CO.*—C. C. Hussey, air impeller div. sales office covering southwest Ohio.

▶ *"AUTOMATIC" SPRINKLER CORP.*—William M. Grier, district sales manager, Chicago district.

▶ *COPELAND REFRIGERATION CORP.*—Harold S. King, district sales manager of central southern states area.

▶ *GENERAL FITTINGS CO.*—David Guttman, sales representative in Metropolitan New York, lower Connecticut, northern New Jersey.

▶ *COBELL INDUSTRIES, INC.*—Joe Anthony, sales engineer in new Houston sales office; Luke O'Bannon, new Oklahoma City sales office.

▶ *SOLAR AIRCRAFT CO.*—Alvey-Hale Co., representative in southern Michigan and northern Illinois.

▶ *PITTSBURGH CORNING CORP.*—Richard E. Wolff, sales representative in Philadelphia office.

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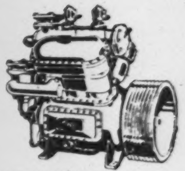
We have all the components

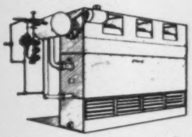
FRICK DISTRIBUTORS *and* FRICK USERS can select from the industry's greatest line of compressors, condensers, coolers, coils and controls.

They also get the advantages of many exclusive Frick engineering developments, a few of which are illustrated. When you or your clients need air conditioning, refrigeration, ice making or quick freezing equipment, in any commercial or industrial sizes, check first with Frick.

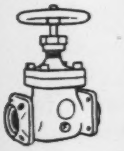
DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.



"ECLIPSE" and heavy-duty compressors: sizes up to 1,000 tons refrigeration.

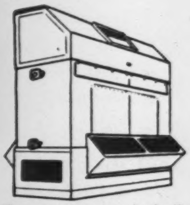


Fan units, pipe coils, shell, zig-zag and other types of coolers for air, water, brine, etc.

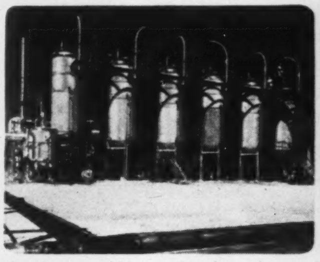


Valves, Fittings and Controls, for manual or full-automatic operation.

Prestfin coils have 9 to 13 times the surface of bare pipe, assure high humidity in storage. Also remove superheat from hot gases.



Evaporative and shell-type condensers.

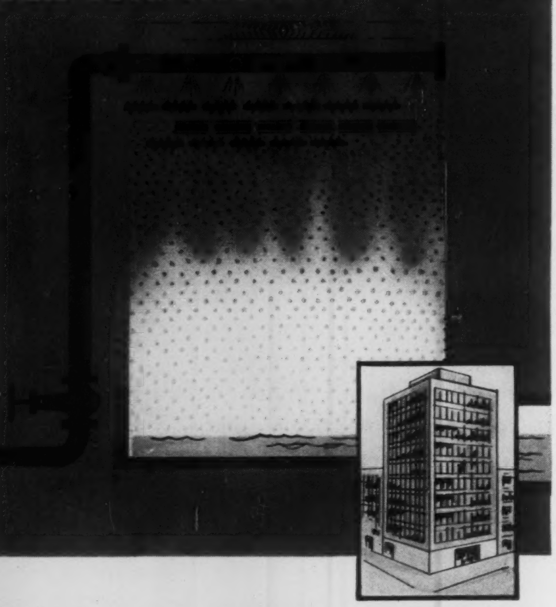


Synthetic rubber and other chemical plants find Frick patented systems the answer to various needs.

Shell-Ice is frozen automatically on stainless-steel tubes, is hard and clear. Preferred in fountains, restaurants, dairies, poultry plants, fisheries, by shippers, etc.

Oakite Airefiner No. 52 in water

GIVES YOU
TROUBLE-FREE
AIR CONDITIONING—3 WAYS



Properly treated water in air conditioning systems goes a long way in prolonging equipment life, improving operating efficiency and keeping systems trouble-free. A small amount of Oakite Airefiner No. 52 added to cooling tower water does all this—and more! A softening and purifying material, Airefiner No. 52:

1. Checks growth of pipe-blocking, jet-clogging algae and slime
2. Prevents build-up of insulating scale
3. Minimizes metal-eating corrosion

Try Oakite Airefiner No. 52 in your water system and see the difference in lower maintenance costs, more efficient cooling, less out-of-service time.

THIS MAINTENANCE MANUAL gives complete details on cleaning and maintaining air conditioning and refrigeration systems at less cost. For your free copy, write Oakite Products, Inc., 51B Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE
In our 50th year

Export Division Cable Address: Oakite
Technical Service Representatives in Principal Cities of U. S. and Canada

WHO'S WHAT

Continued

▶ *ALLIS-CHALMERS MFG. CO.*—Carl E. Hellerich, manager of Wichita district; Frank R. Hunter, manager of Minneapolis district.

▶ *SOLAR AIRCRAFT CO.*—Walling Co., representative in Iowa, Nebraska, South Dakota.

▶ *INTERNATIONAL OIL BURNER CO.*—Alex J. Wason, representative in northern New Jersey, metropolitan New York City.

▶ *CONTROLS CO. OF AMERICA*—Irving H. Finkler, sales engineer, Dallas office; Herbert H. Rauh, sales engineer, Cincinnati office.

▶ *BLACK & DECKER MFG. CO.*—Harry K. Shackelford, industrial-automotive sales representative, San Francisco sales district.

▶ *RECOLD CORP.*—Rodger Engineering Co., representative.

▶ *PENNSYLVANIA RANGE BOILER CO., INC.*—John J. Shand, southern district manager in Georgia, Alabama, Tennessee.

▶ *NORTHWEST FOUNDRY & FURNACE CO.*—A. P. Equipment Co., manufacturer's representative in Missouri, Illinois south from Springfield; Kentucky west from Paducah, Tennessee west from Jackson.

▶ *FOSTORIA CORP.*—Lee Heath, director of new sales office for Chempump and Dynapump Divs. at 1629 Eastern Parkway, Schenectady, N.Y., serving western New York.

▶ *DUNHAM-BUSH, INC.*—E. A. Carell, product manager, West Hartford, Conn.

▶ *ATLAS VALVE CO.*—Automatic Steam Sales Co., sales representative, Chicago area.

▶ *DAYTON INDUSTRIAL PRODUCTS DIV., DAYTON RUBBER CO.*—Richard E. Gurley, Jr., district sales manager, Knoxville, Tenn. area.

▶ *ARMSTRONG CORK CO.*—M. J. Warnock, to board of directors.

WHO'S WHAT

Continued

▶ *PERMATRON CORP.*—Don Clothier, regional sales manager in charge of Los Angeles branch.

▶ *A. Y. McDONALD MFG. CO.*—Joe Stember, resident manager of Rapid City, South Dakota branch.

▶ *H. R. PATAKY SALES AGENCY*—new manufacturers representative in Ohio and surrounding areas for D. H. McCorkle Co., Standard Stamping & Perforating Co., Rymco, Inc.

▶ *WOLVERINE TUBE DIV. CALUMET & HECLA, INC.*—John A. Marshall, San Francisco district sales manager; J. J. Boyett, sales representative, San Francisco district; H. F. Powell, Los Angeles district sales manager; W. C. Glass and C. W. Barker, Los Angeles district sales representatives; R. C. Crow, New York district sales manager; R. B. Davis, manager of industrial sales, Allen Park, Mich.

▶ *RAYPAK CO., INC.*—Richard M. Norton, national sales manager in charge of new warehouse serving eastern seaboard and Canadian territories.

▶ *RUUD MFG. CO.*—Seashore Supply Co., distributor.

▶ *POWERS REGULATOR CO.*—Raymond E. Marsh, Jr., manager of new branch at 109 Lexington, San Antonio, Tex.

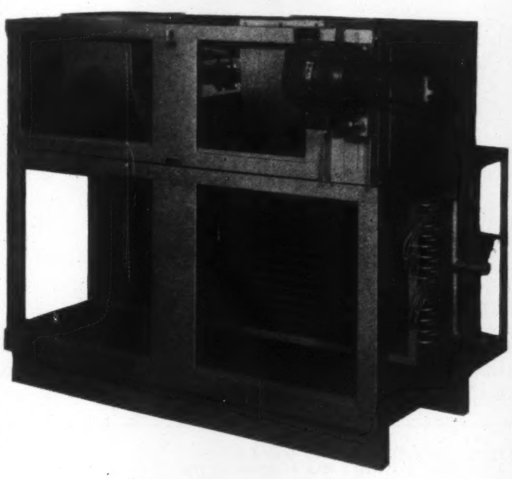
▶ *B-I-F INDUSTRIES, INC.*—Douglas Taber, in charge of eastern region; Paul A. Coffman, Jr., central region; Edward F. Morey, Jr., western region.

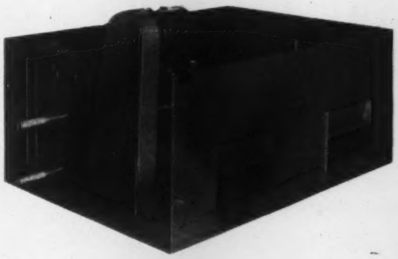
▶ *AMERICAN STANDARD, DETROIT CONTROLS DIV.*—Albert J. Kayser, sales engineer in Texas, Louisiana, Mississippi.

▶ *BOHN ALUMINUM & BRASS CORP.*—David M. Laake, sales engineer for Danville Div. in Virginia, West Virginia, Ohio, eastern Indiana, eastern Kentucky; Hamilton W. Watt, eastern regional sales manager.

▶ *A. M. BYERS CO.*—Standard Supply Co., distributor in Greenville, S.C.; Gulf Coast Marine Supply Co., distributor in Mobile, Ala.; I. Bahcall, Inc., distributor in Appleton, Wisc.

DOMESTIC AIR HANDLING UNITS


Unit Capacities: 2 - 60 tons



- Cabinet fabricated of heavy gauge steel — All welded construction
- Rubberized undercoating sprayed on all interior surfaces including blower housings and galvanized drain pan
- Glass fiber thermal and acoustic insulation
- Century Electric sleeve bearing motors
- Cast iron sheaves with variable pitch motor pulleys
- **Domestic Cooling and Heating Coils:** Direct expansion, chilled water, hot water, Standard steam, Copper tube with aluminum fins, mechanically expanded
- Randall sleeve bearings for quiet operation
- Sponge rubber gaskets under all access panels
- Clarage fans for quiet and positive air delivery
- Exterior surfaces sprayed with rust resisting primer and glossy hammertone gray finish coat

Domestic Manufacturing Corp.

2415 McALLISTER
HOUSTON 24, TEXAS

OPENINGS FOR SALES REPRESENTATIVES IN CERTAIN AREAS

WHO'S WHAT

Continued

▸ *DRAYER-HANSON DIV. NATIONAL-U.S. RADIATOR CORP.*— W. F. Henke, heading new packaged air conditioning products section; Air Conditioning Supply Co., representative for San Diego, Calif. area; Frank Antelline, assistant branch manager; Ray Lewis, assistant sales engineer.

▸ *UNITED SHEET METAL CO., INC.*—J. Paul Ahlbrant, manager of Stockton, Calif. division.

▸ *SPENCER HEATER LYCOMING DIV., ACO MFG. CORP.*—General Heater Corp, manufacturers representative under operation of N.M. Cott in association with S. Shindler and A. W. Klein.

▸ *ALLIS-CHALMERS MFG. CO.*—Robert C. Own, manager, general products div. sales, midwest region; F. H. Woodruff, manager, Evansville; S. M. Osthagen, manager, utility sales, Boston district; C. R. Carlisle, manager, industrial sales, Boston District.

▸ *McINTIRE CO.*—Duane Hale, refrigeration division representative in Texas, Oklahoma.

▸ *POWERS REGULATOR CO.*—Robert P. Koenig, branch manager in Denver; Arthur W. Perlet, to specialty sales staff in Skokie, Ill.; Paul M. Duff, branch manager, Little Rock, Ark.; Quentin P. Thompson, branch manager, Cleveland; Robert A. Davis, branch manager, Buffalo; Raymond E. March Jr., branch manager, San Antonio.

▸ *CHEMPUMP DIV., FOSTORIA CORP.*—Tate Engineering Co., Inc., representative in Baltimore-eastern Maryland area and District of Columbia.

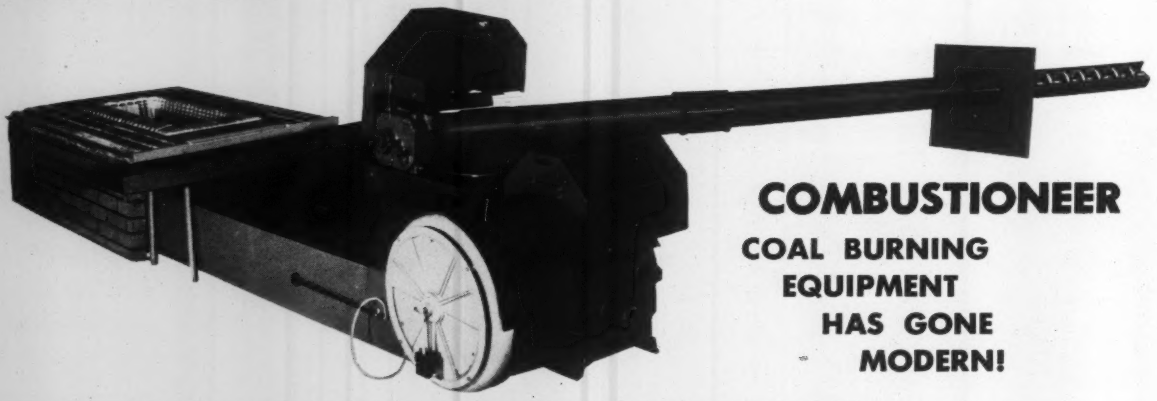
▸ *MUELLER BRASS CO.*—Kenneth I. Mielke, sales representative, Cincinnati office.

▸ *LUNKENHEIMER CO.*—Richard A. McDade, sales representative, Jacksonville, Fla.

▸ *ELECTRO-AIR CLEANER CO., INC.*—Henry C. Fry, western Pennsylvania; George J. Haeck, industrial and commercial sales, western Pennsylvania and northern West Virginia.

▸ *DUNHAM-BUSH, INC.*—Robert Lisbon, sales engineer, northeast territory; William Ewing Clark, application engineer, Cincinnati district office. ⌗

DID YOU KNOW...



COMBUSTIONEER
COAL BURNING
EQUIPMENT
HAS GONE
MODERN!

AS SHOWN ABOVE IN COMBUSTIONEER'S UNIQUE UNIVERSAL BIN FEED STOKER.

A new concept in equipment offering greater flexibility of arrangement in new or existing boiler room design. There is a modern combustioneer coal burning unit available today for all domestic-commercial and industrial applications. Write for complete data.

AUTOMATIC SOLID FUELS EQUIPMENT, INC.
2608 MADISON AVE. — INDIANAPOLIS 3, INDIANA

Original combustioneer factory parts for all models readily available.
Economy is demanding the "swing to coal".

FOR COMPLETE INFORMATION MAIL TO:
AUTOMATIC SOLID FUELS EQUIPMENT INC.
2608 MADISON AVE., INDIANAPOLIS 3, INDIANA

PLEASE PRINT — NAME ____________________
BUSINESS NAME ____________________
ADDRESS ____________________
CITY ________ ZONE ________ STATE ________

WE HEAR THAT . . .

▶ *CRANE CO.* has purchased *NATIONAL-U.S. RADIATOR CORP.* Approval has been obtained from Board of Directors of both companies. All divisions of *NATIONAL-U.S. RADIATOR CORP.* are involved, but they will operate as in the past, according to Theodore B. Focke, president of *NATIONAL-U.S. RADIATOR CORP.*

▶ *STEAM-O-MATIC CORP.* has acquired the *NATIONAL ENGINEERING & MFG. CO.* of Sedalia, Mo.

▶ *PACIFIC TELEPHONE & TELEGRAPH CO.* is converting a business office at El Monte, Calif. to a plant department. *DRAYER-HANSON DIV., NATIONAL-U.S. RADIATOR CORP.* is providing the air conditioning equipment.

▶ *JOSEPH D. POSNER*, project engineer with *M & T CO.* has received an official commendation from the U. S. Navy for work on the design of a new testing device.

▶ *WHITNEY METAL TOOL CO.* has purchased the throatless shear and cam press line as manufactured by *MARSHALLTOWN MFG. CO.*

▶ *BARRY CONTROLS, INC.* has announced acquisition of an expanded facility to house its sales, engineering, and manufacturing operations in Glendale, Calif.

▶ *JANITROL HEATING & AIR CONDITIONING DIV. of SURFACE COMBUSTION CORP.* recently sponsored its second annual goodwill get-together in Columbus, O. for more than 1000 dealers and sales representatives.

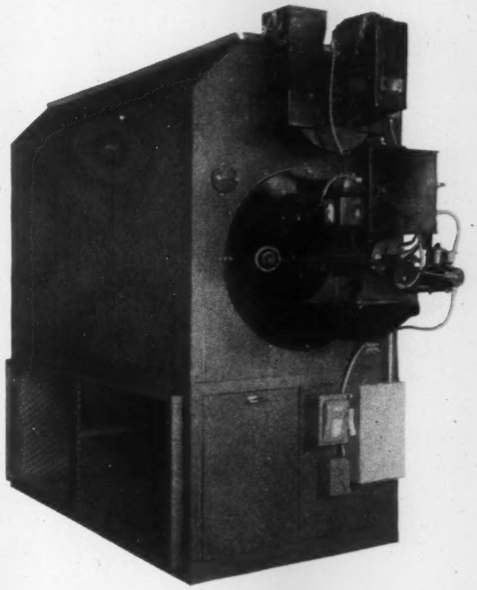
▶ *HOOKER CHARITABLE FOUNDATION, INC.* recently formed by *HOOKER CHEMICAL CORP.* has established a "Corporate Alumnus Program" which provides that the Foundation will contribute an amount equal to sums given by an employee of Hooker Chemical or its subsidiaries, up to $500, to or for the benefit of a qualifying institution of higher learning.

▶ *EUTECTIC WELDING ALLOYS CORP.* has opened a new warehouse at 1371 W. 3rd Ave., Columbus, O.

Johnson

▶ MODEL FA

Packaged Heating Units



Fyre-Tube HEATERS

MODEL FA Sizes to 4,000,000 Btu/hr output

DIRECT FIRED with OIL, GAS, or COMBINATION BURNER.

FLOOR or SUSPENDED MODELS for use with or without ductwork

▶ HEATING ▶ VENTILATING

▶ AIR CONDITIONING

▶ DRYING ▶ MAKE-UP AIR

Aire-Tube HEATERS

MODEL JAS Suspended 17 sizes to 1,000,000 Btu/hr output capacity

MODEL JA FLOOR Type 24 sizes to 5,000,000 Btu/hr output capacity

SOME TERRITORIES STILL AVAILABLE TO EXPERIENCED SALES REPRESENTATIVES

Please mail coupon now!

PLEASE SEND FULL INFORMATION ON JOHNSON HEATER CHECKED

☐ FA ☐ JAS ☐ JA ☐ COMPLETE LINE

Type of Application ....

Name .... Position ....

Firm Name ....

City .... Zone .... State ....

TO: **JOHNSON HEATER CORP.**

1 WINNISIMMET ST.
CHELSEA 50, MASS.

WE HEAR THAT

Continued

- *ALTON MFG. CO.* has added 11,000 sq ft of floor space to its Dallas facilities.

- *AIR REDUCTION SALES CO.* recently broke ground for a new air separation plant at Baton Rouge, La. The plant is expected to be completed by the spring of 1960.

- *BUENSOD-STACEY, INC.* has appointed Andrew Air Conditioning, Ltd. to manufacture air mixing units in the British Isles.

- *CERRO de PASCO CORP.* will occupy a new 15,000 sq ft mill dept in Queens, N.Y. in early January.

- *RAY EISBRENER,* merchandise salesman for *EMERSON ELECTRIC MFG. CO.* has been named "salesman of the year" during the company's national merchandise sales meeting held recently in St. Louis.

- *HYNES ELECTRIC HEATING CO.* has announced that it is no longer a division of *TURBINE EQUIPMENT CO.* but an independent corporation. *GEORGE L. KOESTER, JR.*, is president of the new company.

- 1960 has been proclaimed "Oil Heat's Diamond Jubilee Year" by the *OIL HEAT INSTITUTE OF AMERICA.*

- *MINNEAPOLIS-HONEYWELL REGULATOR CO.* has announced that its facility at Beltsville, Md. has been renamed *INDUSTRIAL SYSTEMS DIVISION.*

- A new company, *UNI-FLEX MFG. & ENGRG., INC.* has been organized with headquarters in Los Angeles.

- January, 1960 marks the 50th anniversary year of *RIC-WIL, INC.*

- *BUCKEYE TOOLS CORP.* has developed a mobile unit to bring its customers and sales organization up to date on new products.

- Creation of a new organization know as *FRAM AIRE CORP., DIV. OF FRAM CORP.* has been announced.

ALL
THIS
100% DUTY CYCLE
225 Amperes Rated Output
5 KW 115/230v AC
1 KW 115v DC
12.9 HP ONAN ENGINE
AND
NOW
ELECTRIC
STARTER
miller

The world-wide respect and demand for this original Miller gas engine driven welder/power plant has never been greater. To this established popularity has now been added the convenience of Bendix drive electric starting as optional equipment on models AEA-200-L and AEA-200. Model illustrated and headlined is AEA-200-LE.

As a welder, as a power plant, as a pipe thawer, indeed, as a top hand from Canadian uranium mines to Brazilian cattle ranches — and on highway construction jobs and repair ships between — the AEA-200-L stands quite alone as "the finest in the field." In addition to optional electric starter, road trailers and rubber tired running gear are also available.

Other Miller gas engine driven DC and AC-DC welder/power plants to 300 amperes at 100% duty cycle. Full particulars will be sent promptly upon request, or a demonstration can be arranged at your convenience.

miller Electric Manufacturing Company, Inc., APPLETON, WISCONSIN

EXPORT OFFICE 250 West 57th St. New York 19 N.Y. • Distributed in Canada by Canadian Liquid Air Co. Ltd. Montreal

WHEN YOU PLAN...

TO SAVE COSTS

Factory-trained Cyclotherm engineers will . . . without charge . . . work with you from drafting board to final installation to estimate your steam demands.

TO SAVE TIME

Factory-trained Cyclotherm servicemen are as close as your telephone . . . at any hour of the day, night or week-ends.

TO SAVE SPACE

Cyclotherm Steam Generators range from 15 to 750 hp. . . . from 15 to 200 psi. For industrial and commercial establishments, shipping, institutions.

Select CYCLOTHERM STEAM & HOT WATER GENERATORS

Planning a new building? Remodeling an existing structure? As much as 1/3 smaller than other packaged units, the Cyclotherm Steam or Hot Water Generator allows more space for storage and production. Needs only a minimum-sized, minimum-cost boiler room. Or your Cyclotherm can be placed in a working area. Its radiant heat loss is at a minimum.

Lighter-weight, it costs less to transport. Simpler in design, it requires less rigging time . . . lower rigging costs.

Yet it delivers a guaranteed 80% efficiency . . . pays for itself in a few years in fuel savings alone . . . cuts maintenance costs up to 50%.

Exclusive, patented Cyclonic Combustion combined with simplicity of boiler design produces maximum heat transfer wringing every degree of heat from each fuel molecule . . . wasting none. Does in 2 passes what other combustion methods accomplish in 4. Cyclotherm's even rate of heat transfer eliminates localized, heat-retarding scale and "hot spots." All these features assure you of long life and maximum performance.

FREE **Discover how Cyclotherm can give you more steam for your dollar. RETURN THIS COUPON TODAY.**

YEARS AHEAD IN STEAM & HOT WATER GENERATION

CYCLOTHERM®

STEAM AND HOT WATER GENERATORS

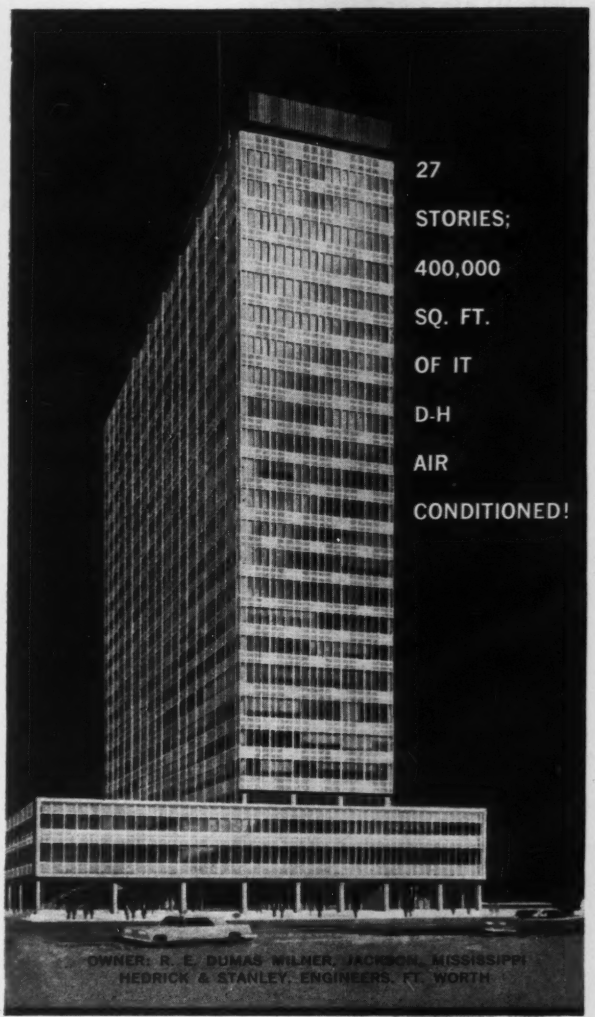
A Division of National-U.S. Radiator Corp., Oswego, N.Y.

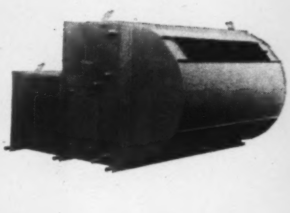
Clip to Your Letterhead

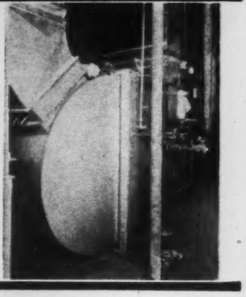
Cyclotherm Division, National-U.S.
Radiator Corp., Dept. 55, Oswego, N. Y.

☐ Please send me your illustrated folder on Cyclotherm Hot Water Generators.

☐ Please send me your illustrated folder on Cyclotherm Steam Generators.


27
STORIES;
400,000
SQ. FT.
OF IT
D-H
AIR
CONDITIONED!
OWNER: R. E. DUMAS MILNER, JACKSON, MISSISSIPPI
HEDRICK & STANLEY, ENGINEERS, FT. WORTH





24 PACE-SETTING NEW D-H HIGH PRESSURE H.C.D. AIR HANDLERS DO IT ...AT NEW KROGER BLDG., CINCINNATI.

NEED LITERATURE?

d-h SINCE 1910

drayer-hanson
DIVISION NATIONAL U.S. RADIATOR CORP
3301 MEDFORD ST., LOS ANGELES 63, CALIF.
CABLE: CLICONI, LOS ANGELES

WE HEAR THAT

Continued

▶ *TORRINGTON MFG. CO.* has recently completed a fully equipped sound laboratory. The new laboratory will be concerned mainly with noise research in air moving devices and the development of new and improved impellers.

▶ *TYPHOON AIR CONDITIONING DIV., HUPP CORP.* has instituted a series of distributor training programs at its Brooklyn headquarters.

▶ A $1.4 million expansion program has been announced by the electric motor div. of *A. O. SMITH CORP.* The expansion includes a 42,000 sq ft plant addition to be completed April 1, 1960.

▶ *WESTINGHOUSE ELECTRIC CORP.* has introduced its 1960 air conditioning and heating program to its distributors at a recent series of distributor sales conferences.

▶ *CLEVELAND HEAT CO.* has purchased the inventory, tools and dies of the *MUSTEE HEATER CO.*

▶ *CARRIER CORP.* recently held a national service training meeting attended by nearly 100 service managers from distributors representing the Unitary Equipment Div.

▶ *ACRE SERVICE* has recently occupied a new 25,000 sq ft building in Brook Hollow, Dallas, Tex.

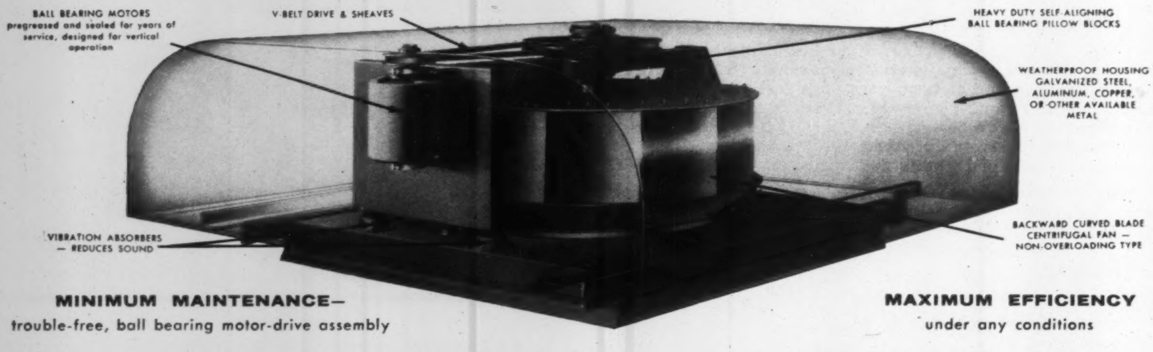
▶ *SLANT/FIN RADIATOR CORP.* has completed negotiations for an additional production plant adjacent to its Richmond Hill, N.Y. site.

▶ Regional managers and home office executives of *ROSS ENGINEERING DIV., MIDLAND-ROSS CORP.* recently met in Cleveland to discuss company policies, procedures and plans for the future.

▶ *FURANE PLASTICS, INC.* has opened a new 6000 sq ft plant in Hempstead, Long Island, N.Y.

▶ *R. W. LEUTWILER* has retired as chief engineer with *ILLINOIS ENGINEERING CO., DIV. OF AMERICAN AIR FILTER CO., INC.* He had been with the firm for 46 years.

NEW! **CKV LOW PROFILE**
STATICKPOWER ROOF VENTILATOR


BALL BEARING MOTORS pregreased and sealed for years of service, designed for vertical operation
V-BELT DRIVE & SHEAVES
HEAVY DUTY SELF-ALIGNING BALL BEARING PILLOW BLOCKS
WEATHERPROOF HOUSING GALVANIZED STEEL, ALUMINUM, COPPER, OR OTHER AVAILABLE METAL
VIBRATION ABSORBERS — REDUCES SOUND
BACKWARD CURVED BLADE CENTRIFUGAL FAN — NON-OVERLOADING TYPE

MINIMUM MAINTENANCE—
trouble-free, ball bearing motor-drive assembly

MAXIMUM EFFICIENCY
under any conditions

Write for Catalog No. 60 — Illustrating complete line of H-P VENTILATORS . . . Power, Gravity and accessories.

The Hirschman-Pohle CKV STATICK LOW PROFILE Power Roof Ventilator is specifically designed for the modern low skyline building trend. Model CKV exhaust ventilator is a streamlined version of the other types of STATICK, quality and performance-proven roof ventilators. Perfect balance for wheels, statically and dynamically, is assured. Motor is sized with ample margin of safety over actual brake horsepower. Fifty years of service in this field, helps Hirschman-Pohle solve your problems. Your inquiries on Model CKV or modifications for unusual situations are invited.

INSULATED DOUBLE SHELL STEEL CURBS are available.

HIRSCHMAN-POHLE CO., Inc. LE ROY, New York

Over 50 Years of Service • *Member of Air Moving & Conditioning Association*

MERCOID
CONTROLS

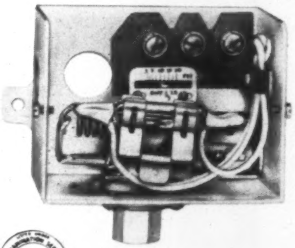
MERCURY SWITCH EQUIPPED

NEW CATALOG AVAILABLE

Fifty-six informative pages—controls for pressure, temperature, liquid level, mechanical movement—available with various case styles for indoor, outdoor or hazardous locations.

ASK FOR CATALOG NO. 860

CHECK THESE NEW PRODUCTS BY MERCOID



New SP-DT low pressure (instrument air) control. Small in size, light in weight. Provides any of following operations: SP cut-in high; SP cut-in low; or SP-DT operation. Two operating ranges 1 to 20 and 1 to 30 psig. External adjustments, visible dial and visible circuit position. See catalog No. 860

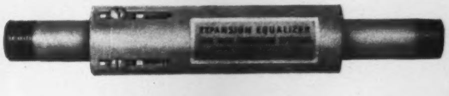
New low pressure diaphragm control for gases or air. Can be used three ways; for pressure, negative (vac.) pressure or differential pressure. External adjustments, visible dial and visible on-off circuit position. Two operating ranges, 1.0″ to 30.0″ and 1/2 to 5 psig. See catalog No. 860

FM

THE MERCOID CORPORATION
4203 Belmont Avenue, Chicago 41, Illinois

EXPANSION EQUALIZERS for STEAM - HOT WATER LINES

HIGH PRESSURE TYPE
TO 150 PSI
MODEL "B"



ADVANTAGES OF EXPANSION EQUALIZERS . . .

Our Expansion Equalizers meet all architects' requirements.

Access panels or special construction not required.

Will last lifetime of heating system.

Noises caused by pipe expansion are eliminated.

We also make all types Expansion Joints, Valve Bellows and Flexible Connectors in Copper, Stainless or Alloy.

LOW PRESSURE TYPE
TO 60 PSI
MODEL "C"

EXPANSION JOINT DIVISION
BADGER FIRE EXTINGUISHER COMPANY
METHUEN, MASS.

WE HEAR THAT

Continued

▶ The name of the *HUMIDIFIER ASSOCIATION* has been changed to the *NATIONAL HUMIDIFICATION ASSOCIATION*.

▶ *CHEMPUMP* and *DYNAPUMP DIVS., FOSTORIA CORP.* have opened new sales offices at 4 Green Village Rd., Madison, N.J.

▶ Ground will be broken for a new air separation plant to supply oxygen to the *TENNESSEE COAL & IRON DIV. of UNITED STATES STEEL CORP.* at Fairfield, Ala. The plants will be installed and operated by *AIR REDUCTION SALES CO.* and will have a capacity of 145 tons per day of high purity industrial gases.

▶ *CLEAVER-BROOKS CO.* has announced transfer of its heater division to its subsidiary, *CLEAVER-BROOKS SPECIAL PRODUCTS,* Waukesha, Wisc.

▶ *DAYTON RUBBER CO.* has formed a new joint company which will sell automotive and industrial rubber products in Europe's Common Market. The new overseas sales company will be known as *DAYTON-HEVEA* and will have headquarters at Arnhem, Netherlands.

▶ *WILSON BROS.* has acquired all outstanding stock of *LAWSON MFG. CO.*

▶ *ARMSTRONG CORK CO.* has begun a two story addition to its research and development center. Completion is expected in early 1960.

▶ *FAFNIR BEARING CO.* and *TIMKEN ROLLER BEARING CO.* recently announced that Fafnir will purchase the assets and business of *FISCHER BEARINGS CO. LTD.,* a Timken British subsidiary.

▶ *TENNEY ENGINEERING, INC.* is completing a 75,000 sq ft plant at Wilmington, N.C.

▶ *MT. HAWLEY MFG. CO.* has been acquired by W. A. Hale, who will be its president. Other executive personnel will be Virgil Watkins, plant manager, and R. E. Wiesner, national sales manager.

▶ Construction has begun on a new research and development division building for *SLANT/FIN RADIATOR CORP.* Completion is expected in early 1960.

ROOF SPRAYING: LOW COST EFFECTIVE RELIEF

- ***Reduce Initial Air Conditioning Cost 20 to 40%***
- ***Reduce Air Conditioning Operating Cost 30 to 40%***
- ***Increase Equipment Life 15 to 20%***

SOME USERS' COMMENTS: SAVED $48,000 Cooling Costs • Decidedly Efficient • Water Lines Never Clog • Increased Efficiency of Present Air Conditioning Equipment • Definite Value • Fulfilled Expectations • Would recommend to anyone • Excellent for Warehouse Cooling • No Hot Ceilings now.

Be Modern! Specify FANJET Thermostatically Controlled Roof Cooling

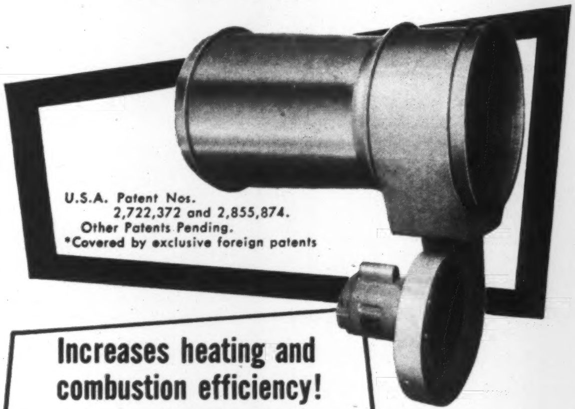
SOME USERS COAST TO COAST: ITT Laboratories (3 systems) • Procter & Gamble (3 systems) • Tung-Sol • Carter's Products (2 systems) • Azoplate Corp. • ITEK Corp. • Firestone • Cornell Aeronautical Laboratory • Sola Electric • Oklahoma Tire & Supply • Lindsay Wire Weaving • Woodall Industries • Marcal Co. • Lockformer Company • Lavezzi Machine Works • Kailer Youngquist Co. • Thompson Ramo Wooldridge, Inc. • Penray Corp.

Patented Pierced Pipe U.S. Pat. No. 2834635 Canadian Patent No. 517416

FANJET ROOF COOLING DIV. (Muellermist Irrigation Co.)
2606 South Ninth Avenue · Maywood, Illinois · AUstin 7-7806

. . . Listed in Chamber of Commerce offices in all major cities . . .

Quickdraft... THE WORLD'S SAFEST POWER DRAFT UNIT FOR INDUSTRIAL, RESIDENTIAL AND INSTITUTIONAL EXHAUSTING



Increases heating and combustion efficiency!

Provides air power for bulk materials handling!

Exhausts corrosive gases and abrasives!

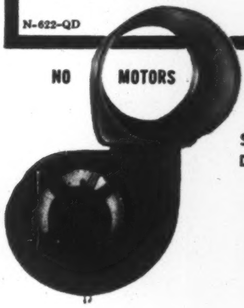
Quickdraft provides industry, commerce, institutions and homebuilders *power draft* engineered for economical and efficient combustion regardless of building or atmospheric conditions. Models suitable for every heating or incinerator application . . . eliminate pulsating or chattering, puffing, smoking and sooting. Reduce building costs, no tall, unsightly stacks required. Quickdraft also provides industry with ¼ inch to 60 inches W.G. static pressure for exhausting corrosive gases, abrasives and paint spray. Heavy-duty, high-pressure models, 6 inches to 30 inches diameter, are available for moving bulk materials or anything that can be moved by air. Because there are no motors, fans or bearings in exhaust line, only Quickdraft avoids costly clogging, corrosion of moving parts or fan failure.

IMPORTANT NOTICE

For withstanding corrosive gases, all Quickdraft units are available in standard acid resisting vitreous enamel, No. 316 Stainless Steel, rigid plastics (P.V.C.) and with plastic and Fiberglas coatings.

N-622-QD

NO MOTORS FANS OR BEARINGS IN EXHAUST LINE

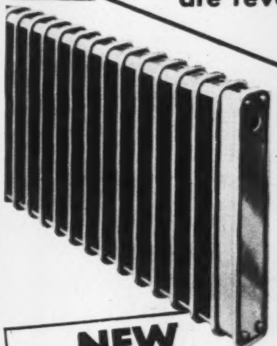


Send for QUICKDRAFT ENGINEERING DATA on your application . . . now.

Quickdraft CORPORATION
P.O. Box 87-K, Canton 1, Ohio

Perkins AIRadiators offer 3 big advantages for Plant-Area Heating

① Safe heat—because it's AIRadiated wet heat
② Out-of-traffic mounting on ceilings or walls
③ Simplified installation—tapping positions are reversible



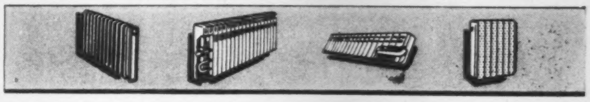
NEW CATALOG
•
Full Information on complete line of SHAW PanelVectors and PERKINS AIRadiators
•
Write For Your Copy Today

Perkins AIRadiators operate on steam or hot water to 150 psi — there are no motors, fans, or other moving parts that can cause dangerous sparking — nothing to wear or fail. They mount easily anywhere on ceilings or walls, away from equipment and traffic. Reversible tapping locations assure simplified installation in either new or existing piping layouts.

Perkins AIRadiators are made in sizes to meet every heating requirement, distribute an exact ratio of radiant and convected heat. Of rigid integral steel and copper construction, they last a plant's lifetime.

Write now for free literature. Ask for Bulletin V.

SHAW SP PERKINS MFG. CO.
Properly Designed Room Heat Distribution Equipment
201 E. CARSON ST., PITTSBURGH 19, PENNA.

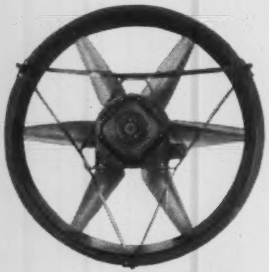


SOUTH BEND
SOUTH BEND AIR PRODUCTS INC
INDIANA

Fans FOR EVERY Industry

AEROSPOT and DYNAFLOW

Aerospot and *Dynaflow* fans rate high in efficiency and safety features . . . offer advanced aerodynamic design and rugged construction. The models shown enjoy wide popularity with industrial users. Any unit may be furnished with **explosion-proof** motor and fan blades.



HEAVY DUTY AEROSPOT

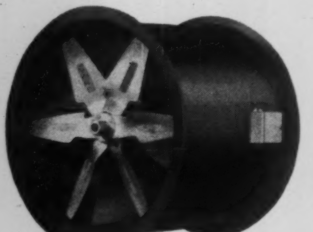
For general or specific ventilation, man-cooling, or parts-cooling . . . to increase personnel efficiency and reduce lost time in cooling and drying hot parts. Portable . . . direction of blast adjustable. Explosion-proof motor, metal conduit and starter can be supplied. Conforms to state safety regulations.

DYNAFLOW UNITS 2-4-6 BLADE TYPES

Six blade model illustrated. For exhausting or blowing against high static pressures. For general ventilation or specific processes where fumes are present. Sizes: 16" to 36" diameter. Capacities: 1240 to 26000 c.f.m. Two and four blade models available for applications at lower static pressures.

EXTENSION ARM DYNAFLOW FOR "HOT" OR "EXPLOSIVE" GASES

For exhausting explosive gases or fumes . . . for circulating "hot" gases up to 350° F. where temperature is too high to permit use of standard or even special motors. Used in heat exchangers, "sweater" ovens, etc. Fans from 16" to 36" diameters.



DUCTYPE UNITS
Direct Drive or Belt Drive

Direct drive model shown, also supplied with belt drive for high temperatures or corrosive air and gas handling. Designed for bolting in any duct run at any point or at either end. Sizes: 16" to 36" fans.

Send for complete specifications and listings of other fans available.

WRITE FOR CATALOG

SOUTH BEND AIR PRODUCTS, Inc.
415 SOUTH ST. JOSEPH STREET • SOUTH BEND 1, INDIANA

WE HEAR THAT

Continued

▶ *HERRMIDIFIER CO., INC.*, recently moved into a new plant in Lancaster, Pa.

▶ *WESTINGHOUSE ELECTRIC CORP.* has begun a sales program in northern states for sale of heat pumps.

▶ *DURO-DYNE CORP.* has established a new company to be known as *DURO-DYNE OF CANADA, LTD.* The new firm will be located at 56 Rugby Place, Montreal West, P.O., Canada with *RAYMOND FELSON* as manager.

▶ *CARRIER CORP.* has joined with New York City school officials in an effort to provide vocational training in order to fill an estimated 7500 service jobs by 1970 in that area.

▶ *INTERNATIONAL NICKEL CO., INC.*, has invented a new family of high strength nickel alloy steels.

▶ *HALSTEAD & MITCHELL* will add 180,000 sq ft to its 135,000 sq ft Zelienople, Pa. plant.

▶ *BOHN ALUMINUM & BRASS CORP.* has acquired all rights to the business of the *PORT EVERGLADES STEEL CORP.*

▶ *GALV-WELD ALLOY PRODUCTS* has established a new distribution program whereby independent distributors will be appointed throughout the country.

▶ The *ILLINOIS BUILDING INDUSTRY ALLIANCE* has initiated an associate membership campaign to expand its goal of coordinating major segments of the state's building industry.

▶ *SWARTWOUT CO.* is moving from Cleveland, Ohio to Kokomo, Indiana and will be known as *SWARTWOUT FABRICATORS, INC.* G. V. Patterson, vice president of Swartwout will be president of the newly formed company.

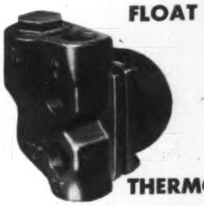
▶ *LOUIS ALLIS CO.* is constructing a new research and development center in Greendale, Wisc.

▶ *ALPHA PLASTICS INC.* has established a custom extrusion dept. ╪

Sterlco® HEATING and TEMPERATURE CONTROL EQUIPMENT

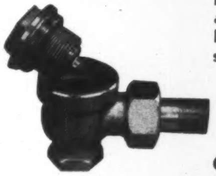
THERMOTROL
(No. 120 Illustrated)

Self-contained individual radiator temperature controls for steam or hot water. Simple to install! Eliminate over-heating, save fuel. Maintain even temperature for comfort and health. Sizes: ½", ¾", 1". Body styles: Angle, Straightway, Corner.



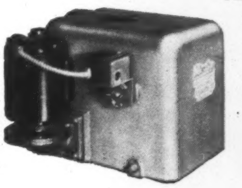
FLOAT AND THERMOSTATIC TRAPS
(69B F&T Trap Illustrated)

Compact, rugged, easy to service. "Vacuum thermostat" vents air, float valve has capacity for large amounts of condensate. Ideal for unit heaters. Sizes: ¾", 1", 1-¼", 1-½", 2". Max. Pressures: 20, 100 psi.



THERMOSTATIC RADIATOR TRAPS

Keep radiators clear of condensate and air, prevent steam waste. Dependable "Vacuum thermostat", sturdy brass bodies and covers, replaceable seats. Sizes: ½", ¾", 1". Max. Pressures: 15, 65, 100, 125 psi. Body styles: Angle, Straightway, Corner, Vertical.



CONDENSATION PUMPS
4200 SERIES (Illustrated)

Neat, convenient unit with cast iron tank, dual voltage capacitator type motor, carbon-type rotary seal. Four sizes of pumps for low pressure jobs up to 15,000 sq. ft. E. D. R. and 20 lbs. pressure.

4100 SERIES — Same as above except steel tank.

3500 SERIES — Heavy duty — 2,000 to 65,000 sq. ft. up to 150 lbs. pressure.

3700 SERIES — Heavy cast iron tank for underground or wet locations. 2,000 to 20,000 sq. ft. 20 or 30 lbs. pressure.

SERIES 150E TEMPERATURE CONTROL VALVE

Self-powered modulating control valve — applicable to any process involving heating or cooling by means of water, oil, steam or other fluids. Monel thermostatic and seal bellows, armored capillary tube, stainless steel trim. Mounts any position. Sizes: ½", ¾", 1". Also 117A Series — 1-¼" to 2". Heating only.

ALSO RADIATOR VALVES, CAST IRON and BRASS Y-TYPE STRAINERS

Write now for complete information.

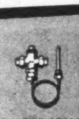
Sterlco Products Distributed Through Leading Heating and Plumbing Wholesalers. Representatives in all principal cities.

STERLING, INC.

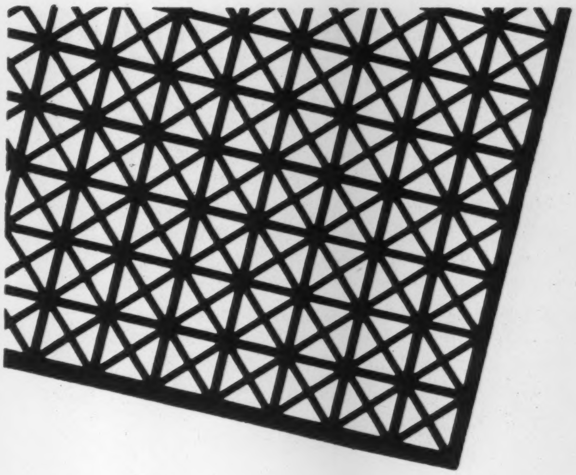
5202 W. Clinton Ave., Milwaukee 18, Wisconsin

CONDENSATION AND VACUUM PUMPS

HEATING SPECIALTIES



TEMPERATURE CONTROLS



THEY'RE ELEGANT ...THEY'RE ECONOMICAL

Hendrick Architectural Grilles

When an architect draws up specifications for a new building or a modernization proposal he must adhere to two basic principles: FIRST, he must use his head in keeping costs down. SECOND, he must recommend functional materials and components that appeal to his client's decorative motif and sense of beauty. That's why more and more architects specify Hendrick Grilles. Available in hundreds of attractive designs, Hendrick Grilles cost less to buy . . . cost less to install and cost less to maintain! And they provide more-than-ample area for free passage of air . . . always lie flat . . . don't bend or warp. For more information write to Hendrick, today.

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48 DUNDAFF STREET **CARBONDALE, PA.**

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles Mitco Open Steel Flooring — Shur-Site Treads • Armorgrids Hydro Dehazers • Petrochemical Column Internals

#625

MEETINGS & CONVENTIONS

1960

JAN. 12-16—*Society of Plastics Engineers, Inc.*, 16th annual technical conference. Conrad Hilton Hotel, Chicago. Information: Society of Plastics Engineers, Inc., 65 Prospect St., Stamford, Conn.

JAN. 18-20—*Compressed Gas Assn., Inc.*, 47th annual meeting. Waldorf-Astoria Hotel, New York City. Information: Compressed Gas Assn., Inc., 11 W. 42nd St., New York 16.

JAN. 25-28—*National Plant Maintenance & Engineering Show and Conference.* Convention Hall, Philadelphia, Pa. Information: Clapp & Poliak, Inc., 341 Madison Ave., New York 17.

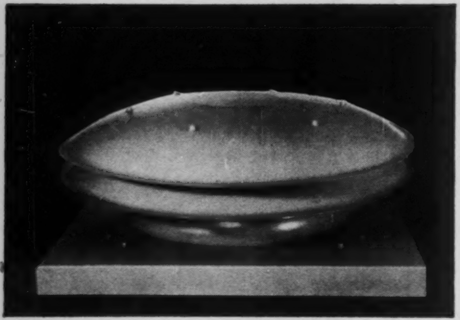
FEB. 1-4—*2nd Southwest Heating and Air Conditioning Exposition.* Dallas. Under auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, in conjunction with the newly merged society's semi-annual meeting also in Dallas. Meetings to be held in the Baker and Adolphus Hotels; exposition to be held in Memorial Auditorium. Information: International Exposition Co., 480 Lexington Ave., New York 17. ASHRAE headquarters: 62 Worth St., New York 13. For more information about the show and meeting, see the Show Section, pages 215-220, in this issue.

FEB. 2-4—*Society of the Plastics Industry, Inc.*, 15th SPI Reinforced Plastics Division Conference. Edgewater Beach Hotel, Chicago. Information: Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.

FEB. 8-11—*12th Short Course on Hydronic Heating and Cooling Systems including Business Management and Promotion.* Conducted by Dept. of Mechanical Engineering and Bureau of Business Management, University of Illinois in cooperation with Institute of Boiler and Radiator Manufacturers. Information: Supervisor of Engineering Extension, 116-D Illini Hall, University of Illinois, Urbana, Ill.

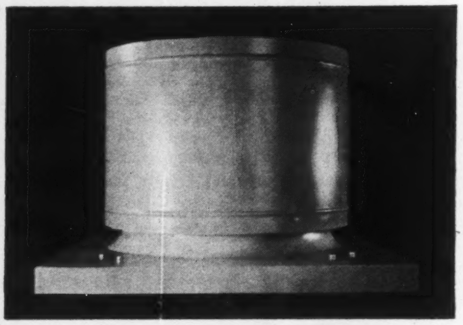
FEB. 15-18—*Industrial Ventilation Conference.* Kellogg Center, Michigan State University, East Lansing, Mich. Co-sponsored by the College of Engineering and the Division of Occupational Health of the Michigan Department of Health. Information: Michigan State University, Kellogg Center for Continuing Education, East Lansing, Mich.

NEW AXIAL ROOF VENTILATORS BY WESTERN



The Westernaire®
Low Silhouette Hooded Exhaust Ventilator

The Westernaire®
Low Silhouette Vertical Exhaust Ventilator



Above: A high efficiency power unit in a low, weather-proof housing. For both commercial and industrial use. 360 degree near horizontal discharge. Aerodynamically correct spun housing. Heavy guage steel, aluminum or non-corrosive Fiberglas* construction.

Low silhouette high efficiency power roof ventilators for vertical or horizontal air discharge provide motor mounting below the venturi to achieve styling compatible with modern architecture plus a smooth airstream discharge pattern.

Above: High capacity power unit specifically designed for industrial usage. Fumes, smoke, dust-laden and foul air projected high above roof to prevent re-entry into building. "Blow-open" dampers rest on neoprene seal. Completely weatherproof.

Other type ventilators include: Rotary, Stationary, Directional, Continuous Ridge, Unit, Power models.

WESTERN ENGINEERING & MFG. CO.
P. O. BOX 66455, LOS ANGELES 66, CALIFORNIA

*TM- Owens Corning Fiberglas Corp.

Since 1921

Write for catalog and name of nearest representative

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"CORRECT PRACTICE in INDUSTRIAL PIPING"

— All-New Third Edition —

196 Pages — 8½" x 11" — $1.50

This practical book is made up of outstanding papers and data on industrial piping selected from past issues of "Heating, Piping & Air Conditioning." It is a most comprehensive collection of case studies, showing how various difficult piping problems encountered in different industrial plants were successfully worked out by piping experts.

Design, installation, operation, and maintenance . . . steam, air, gas, oil, process, water and refrigeration piping . . . piping in pulp and paper and steel mills, in automobile plants and breweries, in the food and chemical and textile industries, and in many other types of manufacturing plants are dealt with from many different angles.

Send $1.50 today for this book to the address below.

(on shipments outside U.S.A. or Canada, add 25c extra postage per book.)

KEENEY
PUBLISHING COMPANY
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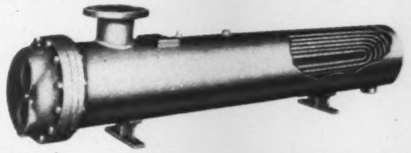
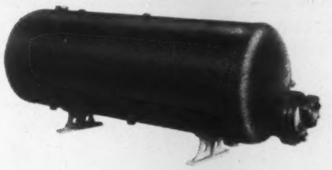
WHITLOCK HEATING AND COOLING *Equipment*

INSTANTANEOUS HEATERS



For use where hot water at a nearly uniform rate is desired. Type R shown has a removable U-tube bundle; other designs are available. Write for Bulletin 20A. Write for details on stock heaters.

STORAGE HEATERS



Type K Storage heaters supply ample hot water at all times. Whitlock-Everdur construction assures lifetime service: Also made in Eterno and Standard Steel. See Bulletin 40A. Write for details on stock heaters.

FUEL OIL HEATERS

Preheating promotes efficient atomization and burning. Type V-1 Heater shown is easily cleaned without breaking line connections. Whitlock heaters are made in a wide range of types and sizes. Ask for Bulletin 35.

WATER CHILLERS

For Air Conditioning service Whitlock chillers are built to meet specific job requirements. The dry expansion cooler illustrated is of U-bend design; refrigerant passes through the tubes and cools water in shell — thus less refrigerant is required and danger of freeze-ups is greatly reduced. Ask for recommendations. Write for Bulletin 140.

Whitlock Engineering Service is complete — Bring your heating or cooling problems to us.

THE WHITLOCK MANUFACTURING CO.

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IN CANADA: DARLING BROTHERS, LTD., MONTREAL

this WALKER Automatic DRAFT REGULATORS Unit...

ENDS DRAFT PROBLEMS

*in gas, oil and solid-fuel installations **

THE INSIDE STORY OF SHUR-FLO EFFICIENCY

- Hi-Volume Self-Feathering Fan
- Self-Cleaning Blades (No Soot Build-up)
- Stainless Steel Shaft, Hub and Blades
- Quiet, Burn-Out Proof Motor
- Silicone Oiled Bearings
- Extra Rigid Mountings
- Extra Heavy Gauge Galv. Steel Construction.

"I don't fret with uncertain draft since Walker brought out this low-priced inducer-regulator. Now I install Walker inducers on all my jobs and have good draft right from the start!"

"Most Efficient Draft System Ever Made"

Say Heating Contractors, Architects, Home Owners

Draft problems end with Walker Shur-Flo (Pats. Pend.), SUREST DRAFT SYSTEM ever devised for oil, coal or gas-fired installations from older homes to modern, low-roofed houses. Install it, forget it! What could be better?

* *Free!* "HOW TO CURE SICK CHIMNEYS"

Now, the *first* ready-reference guide collecting *all* the information on Power Inducer Venting you'll need to solve your draft problems. You'll find it indispensable! Get your handy copy now! Absolutely no obligation.

WRITE TO US AT ADDRESS BELOW

Fan-operated draft-inducer draws *only* flue gases—*not* outside air. Quiet. Costs less to operate. Needs little power. Installs quickly at *any* angle. Virtually eliminates costly callbacks and corrections.

There's a Walker Draft Control for every draft problem regardless of fuel. 29,000,000 in use! The industry's standard of performance.

BALANCED 34 for larger special central heating

TYPE BB commercial and industrial control

ROYAL PURPLE for smaller central heating plants

JUNIOR LINE central heating budget control

DOUBLE SWING for gas-fired equipment

VENTURI CAP for heating and ventilating

See your supplier or write direct to

WALKER MFG. & SALES CORP. 1720 Penn St., St. Joseph, Mo.

MEETINGS & CONVENTIONS

Continued

MARCH 21-24—*2nd Annual Industrial Ventilation Conference.* North Carolina State School of Engineering, Raleigh, N. C. Conducted by Dept. of Mechanical Engineering of School of Engineering and College Extension Division; sponsored by Occupational Health Section of North Carolina State Board of Health. Information: College Extension Div., P.O. Box 5125, State College, Raleigh, N. C.

MARCH 29-31—*22nd Annual American Power Conference.* Hotel Sherman, Chicago. Information: Conference Director, R. A. Budenholzer, Mechanical Engineering Dept., Illinois Institute of Technology, 3300 Federal St., Chicago 16.

APRIL 4-7—1960 *Nuclear Congress and International Atomic Exposition.* New York Coliseum, New York City. Information: International Atomic Exposition, 117 S. 17th St., Philadelphia 3, Pa.

APRIL 4-7—*Oil Heat Institute of America, Convention and Exposition.* Convention: Park-Sheraton Hotel, New York, Exposition: Coliseum, New York. Information: Oil Heat Institute of America, Inc., 500 5th Ave., New York 36.

APRIL 25-29—*American Welding Society,* annual meeting and exposition. Los Angeles. Information: American Welding Society, 33 W. 39th St., New York 18.

APRIL 27-30—*Western Air Conditioning, Heating Ventilating and Refrigeration Exhibit and Conference.* Shrine Exposition Hall, Los Angeles. Information: Western Air Conditioning Industries Association, 3443 S. Hill St., Los Angeles 7.

MAY 9-12—*Instrument Society of America,* 2nd Instrument-Automation Conference and Exhibit. Civic Auditorium and Brooks Hall, San Francisco, Calif. Information: Instrument Society of America, 313 Sixth Ave., Pittsburgh 22, Pa.

JUNE 6-9—*National District Heating Association* 51st Annual Meeting. Grove Park Inn, Asheville, N. C. Information: National District Heating Association, 827 N. Euclid Ave., Pittsburgh 6, Pa.

JULY 25-29—*13th International Congress on Occupational Health.* Waldorf-Astoria Hotel, New York. Information: Dr. Leo Wade, 15 W. 51st St., New York.

The Newest and Latest for Combined Heating, Air Conditioning and Ventilating

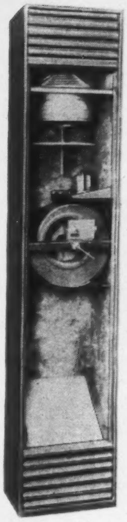
External View

HERE IS

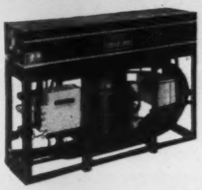
COMBINEX®

This truly packaged fan coil unit REVERSES air flow from heating to air conditioning and takes advantage of natural air currents. Circulating hot water is used for heating; circulating chilled water is employed for air conditioning—both from a central point. A common water coil is used for heating and cooling.

Combinex is an integral unit, factory mounted and wired—no need for carpenters, masons or plasterers. The complete unit provides an insulated shaft from floor to ceiling which forms the wall or part of a dividing wall. Designed to be flush mounted or placed straddling the wall. Also can be installed to deliver air into a distribution plenum chamber formed by a dropped ceiling to provide heating and air conditioning for adjoining rooms from one source.



Internal View



CHILL-A-TRON

A compact, quiet operating water chiller. Capacity 2 to 25 tons.

OTHER KRITZER PRODUCTS INCLUDE

Air Conditioning Coils
Heating Coils
Baseboard Coils
and Grills

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Our latest catalog and prices should be in your files. Send for your copies.

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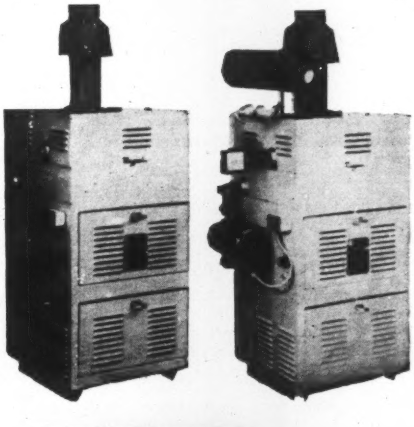
Join the trend to HYDRONICS and RAYPAK the inseparable companions.

Raypak, America's most advanced gas-fired boiler line is moving ahead at a rapid pace — now features 9 sizes complete to 1,200,000 BTU/HR — more sizes coming.

Take your choice of the standard -T model or the packaged -TP model.



Raypak also manufactures swimming pool heaters, storage tanks and coils, heat exchangers and accessories.

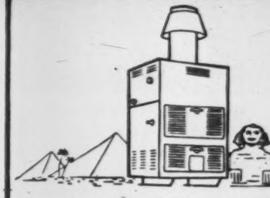
HEART OF THE HOUSE

BHC

MEMBER BETTER HEATING-COOLING COUNCIL

MODULATING GAS VALVE

Holds precise water temperatures — eliminates start and stop noise — saves fuel.



LIFETIME STAINLESS STEEL BURNER

Performance second to none.

LIGHT AND COMPACT

One man installation — saves space.

FINEST MATERIALS

Solid 100% copper and bronze waterways — fastest controlled heat transfer on the market.

A few territories are still available to qualified manufacturers representatives.

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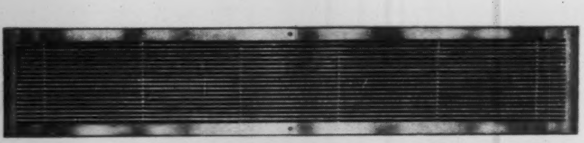
® Engineers-Manufacturers 2416 CHICO AVENUE, EL MONTE, CALIFORNIA



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For Modern Public Buildings

When you need grilles that retain their original attractive appearance indefinitely — against any probable amount of rough treatment — you'll be starting right by sending for our latest bulletins. They show designs developed during nearly half a century of successful experience.

Bulletin 41 illustrates and describes Diamond Architectural Grilles; stamped from any commercial metal in a wide variety of artistic designs; in any desired thickness up to one-fourth inch.

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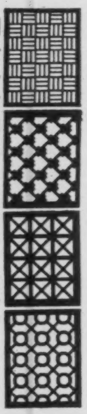
DIAMOND MANUFACTURING CO.

Box 40 WYOMING (Wilkes-Barre Area) PENNA.



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TO 2,000,000 B.T.U.

- **40,948 B.T.U. to 2,000,000 B.T.U. Output.**
- **All units meet the requirements of the ASME Boiler and Pressure Vessel Code.**

PRECISION *Electric* HOT WATER HEATING BOILER

- **Complete unit ready for installation** with circulating hot water system and water chiller for year-round air-conditioning.
- **Conversion easily accomplished** where other type fuels now used. Suited for homes, churches, apartments, hotels, motels, hospitals, commercial buildings, swimming pools, snow melting and domestic hot water. Temperature Range 60 to 250 degrees.
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Write for color brochure and prices.

PRECISION parts corporation

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No ducts! No noise! No chimney! No odors! No flame!

MEETINGS & CONVENTIONS

Continued

NOV. 28-DEC. 2—24th National Exposition of Power and Mechanical Engineering. Under auspices of the American Society of Mechanical Engineers. New York Coliseum. Information: International Exposition Co., Inc., 480 Lexington Ave., N. Y. 17.

Obituaries

Harold A. Lockhart

HAROLD A. LOCKHART, 53, vice president in charge of engineering and chief engineer for Bell & Gossett Co., Morton Grove, Illinois, passed away November 25, 1959.

Mr. Lockhart joined Bell & Gossett in 1934 as chief engineer and was elected vice president in charge of engineering in 1954. He was also a member of Bell & Gossett's board of directors.

He was a director of the American Society of Heating, Refrigeration and Air Conditioning Engineers and a member of the American Society of Mechanical Engineers.

Alfred W. Hammer

ALFRED W. HAMMER, 55, sales manager of the Durez Plastics Division, Hooker Chemical Corp., passed away November 10, 1959.

Mr. Hammer started with Durez Plastics & Chemicals, Inc., in 1929 as a sales engineer, advancing to sales manager and later vice president of molding compound sales. From 1945 to 1955, he was vice president of Durez. He was appointed to the position he held at the time of his death in 1955, when Durez was merged with Hooker.

William Feldermann

WILLIAM FELDERMANN, president, chairman of the board, and founder of Walton Laboratories, and president and chairman of the board of Bruce Metal Products, Inc., died November 13, 1959.

Mr. Feldermann was a pioneer in the development of humidifiers for all types of humidity control. He was an associate member of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers.

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BLAST COILS
HEATING & COOLING

CONDENSERS
AIR COOLED
EVAPORATIVE

AIR HANDLING UNITS
STANDARD
HIGH PRESSURE
MULTI-ZONE

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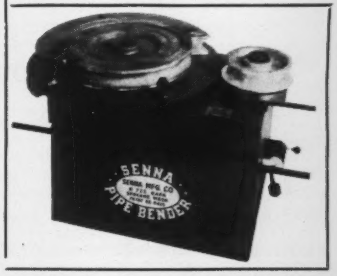
OKARCHE, OKLA.

WHY USE FITTINGS!

Eliminate the use of elbows by using Senna Rotary Cold Benders — The Senna method cuts time, labor, leaks, and pump-load — increases strength and flexibility of piping jobs.

Model S-3 bends $1\frac{1}{2}$" pipe or 2" tube to any degree in seconds on 110 A.C. Quickly adjusts to different radii — High accuracy control — portable



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ELECTRIC ROTARY
PIPE & TUBE BENDERS

VIRTUALLY SERVICE FREE • NON-HYDRAULIC

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HALSEY DISTRIBUTORS
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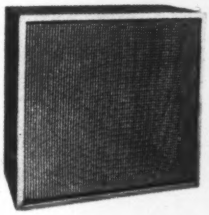
COMPLETE FILTRATION FOR SUB MICRON PARTICLES



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AIRPURE
Absolute Filters

Airpure absolute Filters combine the greatest dust holding capacity with the lowest resistance factor.

- 15% more filter medium, catches more particles
- Filter medium has no binder to clog pores
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Rate it either way: 1000 CFM @ .75" W.G.
1300 CFM @ 1.00" W.G.

Many models available for a wide variety of applications.

FOREMOST PRODUCERS OF ABSOLUTE FILTERS FOR AEC INSTALLATIONS
AIRPURE
Flanders Filters INC
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RIVERHEAD
L. I., N. Y.

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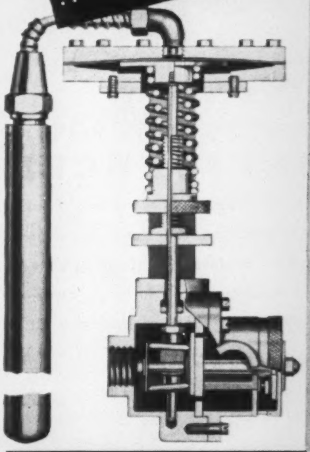
OPW-JORDAN TEMPERATURE CONTROL VALVE
. . . with SLIDING GATE SEATS



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Improve your production efficiency with trouble-free OPW-JORDAN Temperature Control Valves. Fast Delivery.

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NEW BOOKS & REPORTS...

Standard Plant Operator's Questions And Answers—by Steve Elonka and Joseph F. Robinson. McGraw Hill Book Co., Inc., 330 W. 42nd St., New York 36. Vol. 1, $8.00, Vol. 2, $8.00, both volumes, $14.95.

Proceedings of The American Power Conference, March 31—April 2, 1959, Volume XXI. 776 pp. Conference Director, American Power Conference, Illinois Institute of Technology, Technology Center, Chicago 16. $18.00.

Hygienic Guides (Parathion, DDT, Thorium and Its Compounds, Teflon TFE-Fluorocarbon Resins and Their Decomposition Products). American Industrial Hygiene Assn., 14125 Prevost, Detroit 27, Mich. 25¢ each.

American Standard Graphical Symbols for Welding. Y32.3-1959, 100 pp. American Standards Assn., 70

No. 3A
Made split or solid
Clears sleeve ¼" high

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Made split or solid
Clears sleeve 1" high

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CAST IRON & CAST BRASS

Ritter Floor & Ceiling Plates are solidly constructed, well designed, and superbly finished. Ritter plates meet City, State & Federal Specifications. We stock all sizes and styles, split or solid; in plain, Nickel or Chrome Plated finish from ¼" to 12" pipe size. Any special sizes, heights or shapes can be furnished.

Ritter plates have been furnished for : V A Hospitals, Schools, Housing Projects, Terminals, Office Buildings and the United Nations.

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Write For Circulars

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No. 1
Made solid only
Flat Type

No. 7
Made in two halves. Held by two screws. All dimensions to specifications.

Leak Lock
JOINT SEALING COMPOUND
HIGHSIDE CHEMICALS INCORPORATED

Convenient, too!

THE MODERN CONTAINER WITH BUILT-IN APPLICATOR TOP

SPREADS EASILY, QUICKLY, WITHOUT DRYING . . .

STAYS IN PLACE UNTIL ASSEMBLY.

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the joint sealer to use with CONFIDENCE!

Use Leak Lock on threads, flange surfaces. It works where other joint compounds fail . . . will NOT heat spontaneously . . . withstands solvents that eat away other "sealers" . . . stays flexible, withstands shocks, prevents joint freezing. Sold in 4-oz. can—1⅓ oz. squeeze tubes—pint and 10-lb. containers. Write today for:

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Listed by Underwriters' Laboratories for gas, oil, propane and butane equipment.

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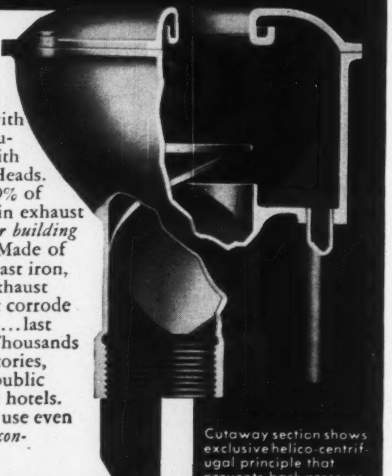

Swartwout
EXHAUST HEADS
slash building maintenance cost

Prevent the ravages of water and oil in exhaust steam during warm weather...do away with ice and grime accumulations in winter—with Swartwout Exhaust Heads. They remove over 99% of moisture and oil in exhaust steam—*for lower building maintenance.* Made of long-lasting cast iron, Swartwout Exhaust Heads do not corrode or deteriorate...last indefinitely. Thousands in use on factories, institutions, public buildings and hotels. Many still in use even after *50 years continuous service.*

Available from your industrial distributor or from The Swartwout Company. For exhaust pipes from 1 to 30" in diameter. Write for free Bulletin S-16-C.

Cutaway section shows exclusive helico-centrifugal principle that prevents back pressure. Swartwout Exhaust Heads blend in with modern or classic architecture, actually enhance building appearance.

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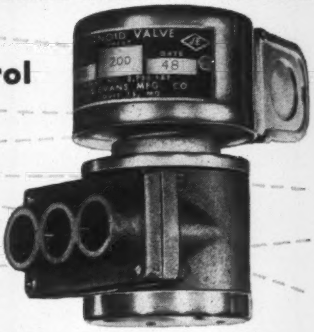
J-E TYPE 701
3-WAY SOLENOID VALVE



for flow control of hot or chilled water with fan-coil units

This New addition to the J-E Line provides–

- **Economical temperature control.**
- **Separable solder flange for easy installation.**
- **One size for ½ to 10 gpm for simple selection**

Write for information bulletin today.

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Controls Division
JACKES-EVANS MANUFACTURING CO.
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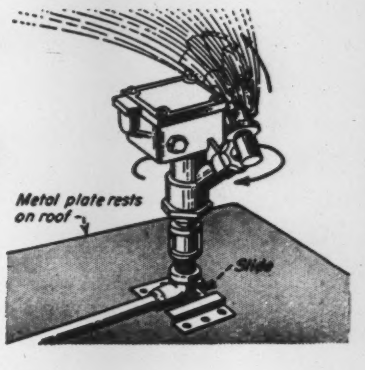
COOL any building from the ROOF

Effectively efficiently economically


Metal plate rests on roof
Slide

by cooling the roof itself.

Sunshine raises the roof temperature and forces heat down into the building. It causes discomfort to the occupants and increases air conditioning load.

Roof Cooling disperses the sun heat by evaporating a thin film of water that is continuously renewed by the slowly rotating roof cooler.

Easily installed, no electricity.

Write to:

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Whatever your needs in any of the above classifications . . . you can solve them quickly with a classified advertisement. The space rates are reasonable and results are quick. Closing date — the tenth of the month preceding issue.

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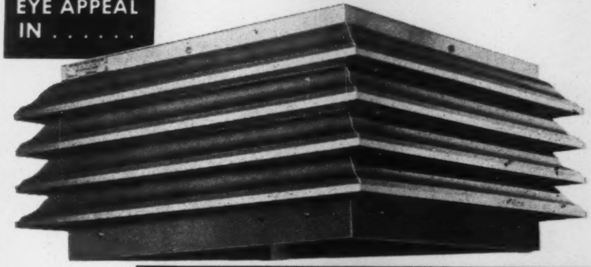

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- MODERN DESIGN — Aluminum Extrusions designed to permit low outlet velocities . . . housing completely weatherproof.
- NO UNSIGHTLY CURB MOUNTINGS — Point of Discharge used in design makes unsightly curb mountings unnecessary.
- MORE RIGID WHEEL SUSPENSION — Unique bearing arrangement places fan wheel center of gravity between the bearings provided, more rigid wheel suspension system . . . bearing well also adds rigidity.
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Write for new catalog, complete details and specifications.

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Filler Metal Comparison Charts. 48 pp. American Welding Society, Dept. T., 33 W. 39th St., New York 18. $2.50.

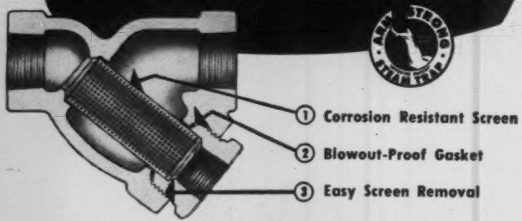
Process Equipment Design—Vessel Design, by Lloyd E. Brownell and Edwin H. Young. 407 pp. John Wiley & Sons, Inc. 440 Fourth Ave., New York 16. $19.50.

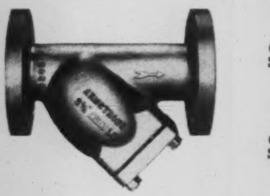
Screw-Thread Standards For Federal Services, 1957 *Part II.* National Bureau of Standards Handbook H28. 119 pp. U.S. Dept. of Commerce National Bureau of Standards, Washington 25, D.C. 75c.

Air Pollution Control, by W. L. Faith. 259 pp. John Wiley & Sons, Inc. 440 Fourth Ave., New York 16. $8.50.

Industrial Noise Manual. American Industrial Hygiene Association 14125 Prevost, Detroit 27, Mich. $7.50. ⌖

Here's a Strainer that's a little better... YET COSTS NO MORE!





CAST IRON STRAINERS, 250 lb. Design
Screwed Connections—¼"-3"
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CHROME MOLY WC6 STRAINERS, 900 lbs., at 900° F
Screwed or Socket Weld Connections—½"-2"

Also available in Type 316 stainless steel and cast bronze.

Your Armstrong Representative can give you the details. Call or write today—ask for Bulletin 605.

Satisfaction Guaranteed

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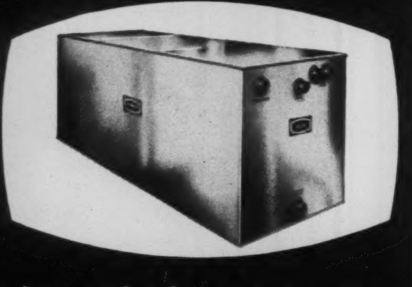
ARMSTRONG Y-TYPE PIPE STRAINERS

"SEE OUR CATALOG IN SWEET'S INDUSTRIAL CONSTRUCTION FILE."



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- CHURCHES
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Dole Refrigerating Products Limited, Oakville, Ontario, Canada

Maximum Refrigeration Efficiency DOLE THE Cel LINE

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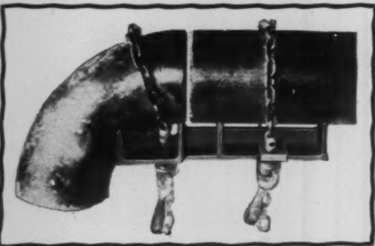
. . . enough JEWEL clamps cut erection costs

PIPE WELDING CLAMPS

Jewel Pipe Clamps are lightweight — rigidly constructed — resist strain, heat and abuse.

FOR WELDING PIPE • FLANGES • ELBOWS • ANGLES —also PIPE MARKERS



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For leakproof, pressure-tight connections..

TiteSeal® Gasket & Joint SEALING COMPOUNDS

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LIQUID-TYPE NON-HARDENING
GASKET & JOINT SEALING COMPOUND

Heat-proof, vibration-proof. Will not shrink, crack or crumble. Prevents formation of rust and corrosion—makes disassembly easy.

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An established manufacturer with 25 years experience, producing ventilating equipment is looking for manufacturer's agents in many sections of the country to sell their new line of industrial fans.

The products include axial flow and tubeaxial fans, both direct and belt driven, and power roof ventilators. Please reply Key 1361A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

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(2) 185 ton Worthington Centrifugal Compressors driven by 200 H.P., 208 Volt, 3 phase electric motors with auxiliary equipment. Used three seasons.
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Experienced
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Diversified projects include
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IDENTIFICATION NAME PLATES for controls and panels — precision engraved on bakelite or black anodized alum. — any titles — quick service by mail on small or large jobs — send for sample and prices. ATLANTIC ENGRAVERS, Coldbrook Road, Wilmington, Vermont.

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Position available in plant engineering division for a graduate chemical or mechanical engineer with at least five years' experience in industrial ventilating systems.

Background should include work on air purifiers, dust removal equipment, etc. for a large multi-unit operation. Must be capable of assuming supervisory responsibilities.

Send complete resume of experience and education to EMPLOYMENT SUPERVISOR, Dept. J-105,

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U. S. Pat. Off.

D. J. MURRAY MANUFACTURING CO.

WAUSAU • WIS.
OFFICES IN PRINCIPAL CITIES
MANUFACTURERS OF GRID CAST IRON
UNIT HEATERS, BLAST HEATERS, RADIATORS.

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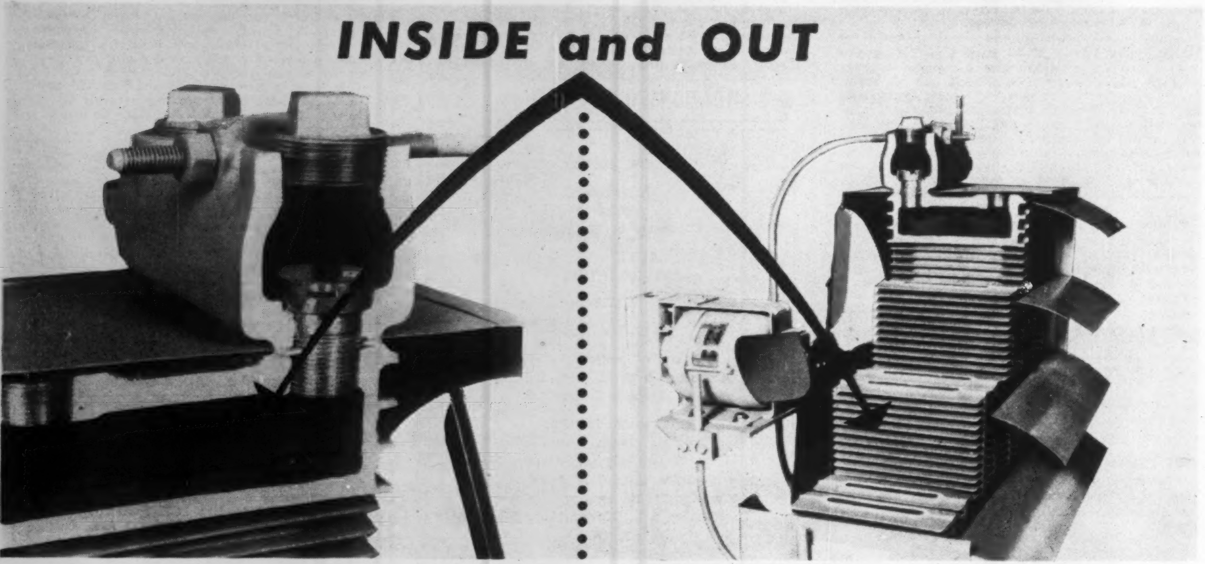
it's the material that makes the difference . . .



CORROSION - Inside and Out - causes heating equipment failures!

BUT NOT WHEN YOU USE

GRID cast iron construction

- UNIT HEATERS
- BLAST HEATERS
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CORROSION internally, caused by electrolytic action as in copper tubes, can't happen in GRID's cast iron steam chambers and headers. Nor can acid condensate corrode the bottom connections. Cast Iron, internally, resists corrosion.

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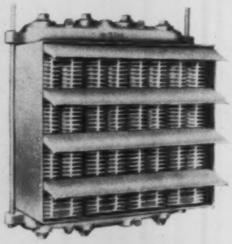
GRID HORIZONTAL BLOW UNIT HEATER DATA

Unit Heater Model	Casing Dimension		Over all Height	Center to Center Hanger Rod	Motor		Vol. Fan Cfm	Capacities at 2 PSIG Steam 60° F Ent. Air		Pipe Size		Support Rod Dia.	Approx. Ship. Wt. Lbs.
	Width	Height			Hp	Rpm		Btu Per Hr	Final Temp. °F	Supply	Return		
CI-1000	13 5/8	15 9/16	15 9/16	11 3/4	1/20	1550	570	27720	103	1 1/4	1 1/4	3/8	150
CI-1200	16 7/8	18 9/16	18 9/16	15	1/12	1700	800	43320	109	1 1/4	1 1/4	3/8	210
CI-1500	15 3/8	16	24 3/8	17 1/4	1/8	1750	1500	73000	104	1 1/2	1 1/2	1/2	280
CI-1520	15 3/8	21	29 3/8	17 1/4	1/8	1750	1700	96730	112	1 1/2	1 1/2	1/2	390
CI-2000	20 1/2	21	29	22 3/8	1/6	1150	2600	134000	107	2	1 1/2	1/2	490
CI-2025	20 1/2	26	34	22 3/8	1/6	1150	2875	163900	112	2	1 1/2	1/2	520
CI-2504	25 3/4	26	35 3/8	27 1/2	1/4	1150	3300	196000	114	2	1 1/2	5/8	660
CI 2500	25 3/4	26	35 3/8	27 1/2	1/2	1150	4350	212500	104	2	1 1/2	5/8	700
CI-2530	25 3/4	31	40 3/8	27 1/2	1/2	1150	4650	262500	111	2	1 1/2	5/8	900
CI-3000	30 7/8	31	40 3/8	32 5/8	1/2	850	5900	305000	107	2 1/2	1 1/2	3/4	1020
CI-3000	30 7/8	31	40 3/8	32 5/8	1 1/2	1150	3000	362000	101	2 1/2	1 1/2	3/4	1070

INSTALL GRID CAST IRON

Send for Catalog 956 . . . The complete story on Grid Unit Heaters, Blast Heaters and Radiators.

UNIT HEATERS

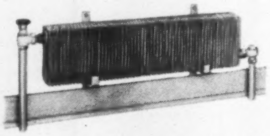


Available in Horizontal and Down Blow models. All cast iron built for steam pressures up to 250 PSI 450 Degrees.

BLAST HEATERS

Wide range of sizes furnished with or without pressure blowers. Compact cast iron design requires less space.

RADIATORS



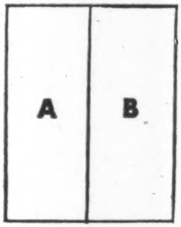
Various combinations with or without Grill covers. For use in confined areas where motorized units are not desirable. For low or high pressures to 250 PSI.

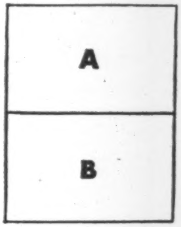
Designed for operation on steam pressure up to 250 PSI 450° temperature

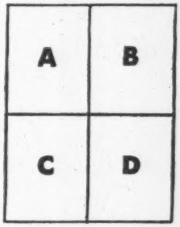
USE THIS CARD FOR MORE INFORMATION ABOUT PRODUCTS ADVERTISED

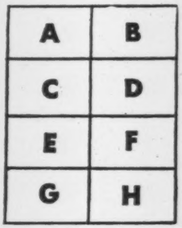
The numbers on this card are page numbers of advertisements in this issue.
Circle the number on the card below that represents the page number of the advertiser in whose products you are interested. If advertisement is two or more pages only first page is listed. If a fractional page ad, the letter following the number indicates position on the page.

TO IDENTIFY FRACTIONAL PAGE ADVERTISEMENTS









You can get the page number directly from the advertisement or from the Advertisers' Index or by referring to Part I of the Directory where products advertised in this issue are classified.

HEATING, PIPING & AIR CONDITIONING, CHICAGO, ILL. **DATE** ____________

Please have manufacturers whose numbers are circled below send me their literature on the products they advertise in this issue (January 1960).

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NAME .... **POSITION** ....

COMPANY ....

ADDRESS .... **City** .... **Zone** ...... **State** ....

CONS. ENGR. .... **CONTRACTOR** .... **PLANT ENGR.** .... **BLDG. ENGR.** .... **OTHER** ....

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FIRST CLASS
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Chicago, Illinois

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HEATING, PIPING & AIR CONDITIONING

6 North Michigan Avenue

CHICAGO 2, ILLINOIS

Section of January 1960 Heating, Piping & Air Conditioning

1960 DIRECTORY

Heating, Piping, and Air Conditioning Equipment for Industrial, Commercial, Institutional and Public Buildings

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Products advertised in this issue classified in "directory style." For pages on which advertising of manufacturers in this issue appears, see pages referred to opposite manufacturers listed under products advertised in this issue. See page 177d in this Directory Section for complete listing of all advertisers.

PART 2—All Products Classified—Page 11d

All products classified alphabetically, along with names of manufacturers. (Arranged by noun governing; for example, "unit heaters" listed under "heaters, unit.")

PART 3—All Trade Names—Page 131d

Product trade names alphabetized, identified with names of manufacturers. Trade names the same as or identifiable from company names are not listed. Manufacturers with such trade names can be found under their product classifications in Parts 1 & 2.

PART 4—All Manufacturers' Addresses—Page 155d

Names and addresses of all manufacturers.

Heating, Piping & Air Conditioning
6 N. Michigan Ave.
Chicago 2, Illinois

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DIRECTORY SECTION

HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS

PART 1—PRODUCTS ADVERTISED IN THIS ISSUE

The products classified in this Part 1 of the Directory Sections are only those advertised in this issue. For the complete listings of these and other products made by all manufacturers, see Part 2, starting on page 11d. For the pages on which you will find the advertising of manufacturers in this issue, see the Index to Advertisers on page 177d of this yellow Directory Section. Page numbers in this Part 1 are given as an extra convenience. Some page numbers may not be correct in this Part 1 because of necessary shifts after this Part went to press. The Index to Advertisers on page 177d of this Directory Section should be referred to for advertisers in this issue.

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G & O Mfg. Co.	377
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Beacon Brass Co., Waltham, Mass.
Bernstrom, Inc., C. R., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Dormont Mfg. Co., Pittsburgh, Pa.
Elcen Metal Products Co., Franklin Park, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
General Fittings Co., East Greenwich, R. I.
General Rubber Corp., Tenafly, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Josam Manufacturing Co., Michigan City, Ind.
Kam Products Corp., Brooklyn, N. Y.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Manufacturers Corp., Mansfield, O.
Packless Metal Hose, Inc., Mt. Vernon, N. Y.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Techniflex Div., Port Jervis, N. Y.
United Metal Hose Co., Inc., Long Island City, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Wade Mfg. Co., Elgin, Ill.
Zurn Industries, Inc., Erie, Pa.

ABSORBERS, SOUND, DUCT SECTION, PREFABRICATED, FOR NOISE CONTROL IN DUCT SYSTEMS

Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Celotex Corp., The, Chicago, Ill.
Elof Hansson, Inc., Acoustical Div., New York, N. Y.
General Sound Control, Inc., Hollydale, Calif.
Industrial Acoustics Co., Inc., New York, N. Y.
Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Co., Baltimore, Md.
Insul-Coustic, Inc., Maspeth, L. I., N. Y.
Korfund Co., Inc., Long Island City, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Midwest Noise Control, Indianapolis, Ind.
Owens-Corning Fiberglas Corp., New York, N. Y.
Silence, Inc., Farmingdale, N. Y.
Sound Reduction Corp., East Hartford, Conn.
United Sheet Metal Co., Inc., Columbus, O.

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See Hose, Flexible, Metal and Fittings; Bases Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type; Connectors, Duct, Flexible

ABSORBERS, VIBRATION, FOR REFRIGERANT AND OTHER PIPE LINES

Allied Metal Hose Co., Long Island City, N. Y.
Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Fabreeka Products Co., Inc., Boston, Mass.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
General Rubber Corp., Tenafly, N. J.
Johnson Metal Hose, Inc., Waterbury, Conn.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Korfund Co., Inc., Long Island City, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
MB Electronics, New Haven, Conn.
Packless Metal Hose, Inc., Mt. Vernon, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Resistoflex Corp., Roseland, N. J.
Saussé & Co., M.W., Los Angeles, Calif.
Seamlex Co., Inc., Long Island City, N. Y.
Techniflex Div., Port Jervis, N. Y.
United Metal Hose Co., Inc., Long Island City, N. Y.
United States Rubber Co., New York, N. Y.
Universal Metal Hose Co., Chicago, Ill.
Vibration Mountings, Inc., Corona, N. Y.
Wade Mfg. Co., Elgin, Ill.
Williamson Co., The, Cincinnati, O.

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ACCESS DOORS AND PANELS

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ACCUMULATORS, REFRIGERATION (FOR AIR CONDITIONING)

Bohn Aluminum & Brass Corp., Detroit.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Greer Hydraulics, Inc., Jamaica, N. Y.
Kenmore Machine Products, Inc., Lyons, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Phillips & Co., H. A., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Research, Inc., Brighton, Mich.
Remco, Inc., Zelienople, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.
Watsco, Inc., Hialeah, Fla.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wolverine Tube, Div. of Calumet & Helca, Inc., Allen Park, Mich.
XL Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

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ADHESIVES, FOR INSULATION OTHER THAN PIPE

Adhesive Products Corp., New York, N. Y.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Arno Adhesive Tapes, Inc., Michigan City, Ind.
Cain Mfg. Inc., Birmingham, Ala.
Capac Mfg. Corp., Capac, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati O.
Chemical Coatings & Engineering Co., Media, Pa.
Columbia Cement Co., Brooklyn, N. Y.
Cordo Chemical Corp., Norwalk, Conn.
Dennis Chemical Co., St. Louis, Mo.
Dow Corning Corp., Midland, Mich.
Durkee-Atwood Co., Minneapolis, Minn.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Eagle-Picher Co., Cincinnati, O.
Flintkote Co., The, New York, N. Y.
Formica Corp., The, Cincinnati, O.
Forty-Eight Insulations, Inc., Aurora, Ill.
Fuller Co. of Calif., H. B., So. San Francisco Calif.
Fuller Co., H. B., St. Paul, Minn.
Gilbreth Co., The, Philadelphia, Pa. (Teflon
Goodrich Industrial Products Co., B. F Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Insul-Coustic, Inc., Maspeth, Long Island N. Y.
Johns-Manville, New York, N. Y.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., St. Paul, Minn.
Miracle Adhesives Corp., Bellmore, N. Y.
Moore Inc., Goodloe E., Danville, Ill.
National Cork Co., Englewood, N. J.
Presstite Div., American-Marietta Co., St. Louis, Mo.
Raybestos-Manhattan, Inc., Passaic, N. J.
Rubber & Asbestos Corp., Bloomfield, N. J.
Schwartz Chemical Co., Inc., Long Island City, N. Y.
Silvercote Products, Inc., Chicago, Ill.
St. Clair Rubber Co., Detroit, Mich.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Swift & Co., Adhesive Products Dept., Chicago, Ill.
Taft Jenkins Co., Inc., Holyoke, Mass.
Williamson Adhesives, Inc., Skokie, Ill.
Xylos Rubber Co., Akron, O.

ADHESIVES, FOR PIPE COVERING

Adhesive Products Corp., New York, N. Y.
Arabol Mfg. Co., New York, N. Y.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Arno Adhesive Tapes, Inc., Michigan City, Ind.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Cain Mfg. Inc., Birmingham, Ala.
Capac Mfg. Corp., Capac, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chemical Coatings & Engineering Co., Media, Pa.
Columbia Cement Co., Brooklyn, N. Y.
Cordo Chemical Corp., Norwalk, Conn.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Flintkote Co., The, New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Fuller Co. of Calif., H. B., So. San Francisco, Calif.
Glo-Brite Products Inc., Chicago, Ill.
Goodrich Industrial Products Co., B. F., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.

Insul-Coustic, Inc., Maspeth, L. I., N. Y.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., St. Paul, Minn.
Miracle Adhesives Corp., Bellmore, N. Y.
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Mystik Adhesive Products, Inc., Chicago, Ill.
National Cork Co., Englewood, N. J.
Pecora Inc., Philadelphia, Pa.
Presstite Div., American-Marietta Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
Ruberoid Co., New York, N. Y.
St. Clair Rubber Co., Detroit, Mich.
Sauereisen Cements Co., Pittsburgh, Pa.
Schwartz Chemical Co., Inc., Long Island City, N. Y.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Swift & Co., Chicago, Ill.
Taft Jenkins Co., Inc., Holyoke, Mass.
Tropical Tape Div., Fort Lauderdale, Fla.
Xylos Rubber Co., Akron, O.

ADSORBERS, ODOR, FOR DUCT SYSTEMS

Barnebey-Cheney Co., Columbus, O.
Connor Engineering Corp., Danbury, Conn.
Easton R. S. Corp., Brooklyn, N.Y.
Lord & Clark Co., Inc., Boston, Mass.
Manning Co., Charles E., Pittsburgh, Pa.
Oshkosh Filter & Softener Co., Oshkosh, Wis. (from water supply)
Puritron Corp., New Haven, Conn.
Radex Corp., Chicago, Ill.
Research Products Corp., Madison, Wis.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Williams Chemical Co., New York, N. Y.

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AFTERCOOLERS, COMPRESSED AIR

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
American Moistening Co., Cleveland, N. C.
American-Standard Industrial Div., Detroit, Mich.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., West Chester, Pa.
Bury Compressor Co., Erie, Pa.
Buxton Mfg. Co., Dover, N. J.
Centrifix Corp., Cleveland, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Condenser Service & Engineering Co. Inc,, Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle and Roth Mfg. Co., Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Gardner-Denver Co., Quincy, Ill.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-X Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Joy Mfg. Co., Pittsburgh, Pa.
LeRoi Div., Westinghouse Air Brake Co., Milwaukee, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schramm, Inc., West Chester, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Burlington, Mass.
Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., East Orange, N. J.
Yates-American Machine Co., Heat Transfer Products Div., Beloit, Wis.
Young Radiator Co., Racine, Wis.
Yula Corp., Bronx, N. Y.

AFTERCOOLERS, FOR HOT LIQUIDS

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Downington Iron Works, Inc., Div. of Pressed Steel Tank Co., Downington, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Wilson Engineering Corp., Chicago, Ill.

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AIR VOLUME METERS

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AIR WASHERS

See Washers, Air

ALARMS, COMBUSTIBLE GAS

Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill (audible)
Bristol Co., The, Waterbury, Conn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Electro Devices, Inc., Mt. Prospect, Ill.
Hogart Engineering Co., Los Angeles, Calif.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taller & Cooper, Inc., Brooklyn, N. Y.

ALARMS, HIGH AND LOW BOILER WATER

American District Telegraph Co., New York, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill. (audible)
Defender Instrument & Regulator Co., Boody, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Electro Devices, Inc., Mt. Prospect, Ill.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Photobell Co., Inc., New York, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schaub Engineering Co., Fred H., Chicago, Ill.
Texas Instruments, Inc., Houston, Tex.
Watts Regulator Co., Lawrence, Mass.
Way-Wolff Associates, Inc., Long Island City, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.

ALARMS, HIGH AND LOW FLOW, FOR PIPING SYSTEMS

Benjamin Electric Mfg. Co., Des Plaines, Ill. (audible)
Brooks Rotameter Co., Lansdale, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electro Devices, Inc., Mt. Prospect, Ill.
Fischer & Porter Co., Hatboro, Pa.
Henzey Co., Watertown, Wis.
Instruments, Inc., Tulsa, Okla.
Magnetrol, Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Oxygen Equipment & Service Co., Chicago, Ill.
Rockwood Sprinkler Co., Worcester, Mass.

ALARMS, LIQUID LEVEL, AUDIBLE

American District Telegraph Co., New York, N. Y.
Applied Mechanics Co., Boston, Mass.
Automatic Control Co., St. Paul, Minn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Electro Devices, Inc., Mt. Prospect, Ill.
Fischer & Porter Co., Hatboro, Pa.
Healy Ruff Co., St. Paul, Minn.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Magnetrol, Inc., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Oil Equipment Mfg. Corp., New Haven, Conn.
Petrometer Corp., Long Island City, N. Y.
Photomation, Inc., Bergenfield, N. J.
Reliance Gauge Column Co., Cleveland, O.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Uehling Instrument Co., Paterson, N. J.
Way-Wolff Associates, Inc., Long Island City, N. Y.

ALARMS, LIQUID LEVEL, VISUAL

Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Electro Devices, Inc., Mt. Prospect, Ill.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
Fischer & Porter Co., Hatboro, Pa.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Instruments, Inc., Tulsa, Okla.
Kenco Pumps Div., American Crucible Products Co., Lorain, O.
Magnetrol, Inc., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Scully Signal Co., Melrose, Mass.
Texas Instruments, Inc., Houston, Tex.
Uehling Instruments Co., Paterson, N. J.
Way-Wolff Associates, Inc., Long Island City, N. Y..
Worner Electronic Devices, Rankin, Ill.

ALARMS, SMOKE

American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill. (audible)
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cardox Corp., Chicago, Ill.
Cleveland Controls, Inc., Cleveland, Ohio
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Electro Devices, Inc., Mt. Prospect, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fyr-Fyter Co., Dayton, O.
Heat-Timer Corp., New York, N. Y.
McNeill Smoke Eliminator Co., Chicago, Ill.
Photobell Co., Inc., New York, N. Y.
Photomation, Inc., Bergenfield, N. J.
Reliance Instruments Mfg. Corp., Glen Cove, Long Island, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Way-Wolff Associates, Inc., Long Island City, N. Y.
Worner Electronic Devices, Rankin, Ill.

ALARMS, TEMPERATURE

America District Telegraph Co., New York.
Barber-Colman Co., Rockford, Ill.
Benjamin Electric Mfg. Co., Des Plaines, Ill. (audible)
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cleveland Controls, Inc., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Devco Engineering Inc., Control Systems Div., Caldwell, N. J.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Electro Devices, Inc., Mt. Prospect, Ill.
Fischer & Porter Co., Hatsboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Thermo Electric Co., Inc., Saddle Brook, N.J
United Electric Controls Co., Watertown, Mass.

ALGAE AND SLIME CONTROL, WATER TREATMENT FOR

See Treatment, Water, for Slime and Algae Control

ALUMINUM COATED SHEETS

See Sheets, Aluminum Coated

ALUMINUM PIPE

See Pipe, Aluminum

ALUMINUM SHEETS

See Sheets, Aluminum

AMMETERS

Columbia Electric Mfg. Co., Cleveland, O.
Daystrom-Weston Sales Div., Daystrom Inc., Newark; N. J.
EPIC, Inc., New York, N. Y.
Pyramid Instrument Corp., Lynbrook, Long Island, N. Y.
Sangamo Electric Co., Springfield, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.

ANALYZERS, CARBON DIOXIDE, PORTABLE

Airserco Mfg. Co., Inc., Pittsburgh, Pa. (electrical)
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Cardox Corp., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
Hays Corp., Michigan City, Ind.
Mine Safety Appliances Co., Pittsburgh, Pa.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.
Will Corp., Rochester, N. Y.

ANALYZERS, OXYGEN

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Ellison Draft Gage Co., Chicago, Ill.
Hays Corp., The, Michigan City, Ind.
Milton Roy Co., Philadelphia, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Oxygen Equipment & Service Co., Chicago, Ill.

ANCHORS, EXPANSION

Arro Expansion Bolt Co., Marion, O.
Chicago Expansion Bolt Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Elcen Metal Products Co., Franklin Park, Ill.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Holub Industries, Inc., Sycamore, Ill.
Modern Hanger Corp., Cleveland, O.
National Lead Co., New York, N. Y.
Paine Co., Addison, Ill.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
U. S. Expansion Bolt Co., York, Pa.

ANCHORS FOR INSULATION

See Fasteners, Insulation

ANEMOMETERS

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Beckman & Whitley, Inc., San Carlos, Calif
Dietzgen Co., Eugene, Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
EPIC, Inc., New York, N. Y.
Flow Corp., Arlington, Mass. (Hot wire)
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Hastings-Raydist, Inc., Hampton, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Willson Products Div., Reading, Pa.

ANGLE VALVES

See Valves, Angle

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Acme Steel Co., Chicago, Ill. (slotted angle)
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Anaconda Aluminum Co., Louisville, Ky., (aluminum)
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn. (aluminum)
Byers Co., A. M., Pittsburgh, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago, Ill. (steel angle rings for fans, ducts, pipe)
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Dow Chemical Co., The, Midland, Mich.
Harvey Aluminum, Torrance, Calif.
Inland Steel Co., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kling Bros. Engineering Wks., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.
Lees Div., John, The Serrick Corp., Muncie, Ind.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass, Inc., New York, N. Y.
Reynolds Metals Co., Richmond, Va.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ANODES FOR CORROSION PROTECTION

See Devices, Electrolytic, for Preventing Corrosion

ANTI-FREEZE COMPOUNDS FOR SNOW MELTING
See Compounds, Anti-Freeze

AQUASTATS
See Thermostats

ARC WELDERS
See Welders, Arc

ARC WELDING ELECTRODES
See Electrodes, Arc Welding

ASBESTOS FIBER AND CEMENT PIPE
See Pipe, Asbestos Fiber and Cement

ASBESTOS MATERIALS
See Insulation

ASBESTOS PACKING
See Packing, Asbestos

ASH CONVEYORS
See Conveyors, Coal and Ash

ASSEMBLIES, MANIFOLD, FOR METERS
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.

ATOMIZING NOZZLES
See Nozzles, Atomizing

ATTENUATOR BOXES, SOUND
See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

AXIAL FLOW FANS
See Fans, Axial Flow, Pressure Type

BACK-DRAFT DAMPERS
See Dampers, Air, Back-draft

BACKING RINGS
See Rings, Backing, for Pipe Welding

BAGS, DUST, FOR DUST COLLECTORS
Day Co., The, Minneapolis, Minn.
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Ducon Co., Inc., The, Mineola, N. Y.
Menardi & Co., El Segundo, Calif.
Modern Dust Bag Co., Inc., West Haverstraw, N. Y.
Wheelabrator Corp., Mishawaka, Ind.

BALANCE CLIPS
See Clips, Balance, Blower Wheel

BALANCING ELBOWS AND TEES, FOR HOT WATER HEATING AND CHILLED WATER SYSTEMS
See Elbows and Tees, Balancing, for Hot Water Heating and Chilled Water Systems

BALANCING EQUIPMENT
See Equipment, Balancing

BALANCING VALVES
See Valves, Balancing

BALL BEARINGS
See Bearings, Ball

BAROMETRIC CONTROLS
See Controls, Draft, Barometric

BARRIERS, VAPOR, FOR BUILDING INSULATION
Alumiseal Corp., New York, N. Y.
American Sisalkraft Corp., Attleboro, Mass.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Bemis Bro. Bag Co., St. Louis, Mo.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Corrosion Control Co., Inc., New York, N. Y.
Ellis & Watts Products, Inc., Cincinnati, O.
Foster Co., Benjamin, Philadelphia, Pa.
Infra Insulation, Inc., West Nyack, N. Y.
Insul-Coustic Corp., Maspeth, N. Y.
Koppers Co., Inc., Pittsburgh, Pa. (polyethylene film)
Mundet Cork Corp., North Bergen, N. J.
Pacific Lumber Co., The, San Francisco, Calif.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.
Richkraft Co., Chicago, Ill.

BARRIERS, VAPOR, FOR DUCT INSULATION
Alumiseal Corp., New York, N. Y.
American Sisalkraft Corp., Attleboro, Mass.
Armstrong Cork Co., Lancaster, Pa. (plastic asphalt emulsion)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Corrosion Control Co., Inc., New York, N. Y.
Owens-Corning Fiberglas Corp., New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Infra Insulation, Inc., West Nyack, N. Y.
Richkraft Co., Chicago, Ill.

BARRIERS, VAPOR, FOR PIPE INSULATION
Alumiseal Corp., New York, N. Y.
American Sisalkraft Corp., Attleboro, Mass.
Armstrong Cork Co., Lancaster, Pa. (plastic asphalt emulsion)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Corrosion Control Co., Inc., New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Infra Insulation, Inc., West Nyack, N. Y.
Johns-Manville, New York, N. Y.
MMM, Inc., Houston, Tex.
Mundet Cork Corp., North Bergen, N. J.
Owens-Corning Fiberglas Corp., New York, N. Y.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.
Zippertubing Co., The, Los Angeles, Calif.

BASEBOARD RADIATION
See Radiation, Baseboard

BASES, MOTOR, TENSION ADJUSTING
Ackermann Mfg. Co., Subsid. of Wheeling Steel Corp., Wheeling, W. Va.
American Pulley Co., Philadelphia, Pa.
Automatic Motor Base Co., Windsor, N. J.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Electrovent Fan & Mfg. Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Industrial Marketers, Ferndale, Mich.
Korfund Co., Inc., Long Island City, N. Y.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Rhoads & Sons, J. E., Wilmington, Del.
Valley Foundry & Machine Works, Inc., Fresno, Calif.

BASES, VIBRATION ISOLATING, PAD TYPE
Air-Loc Div., Clark, Cutler, McDermott Co., Franklin, Mass.
American Felt Co., Glenville, Conn.
Barry Controls, Inc., Watertown, Mass.
Celotex Corp., The, Chicago, Ill.
Connecticut Hard Rubber Co., New Haven, Conn. (rubber)
Fabreeka Products Co., Inc., Boston, Mass.
Felters Co., The, Boston, Mass. (adjustable)
Finn & Co., Inc., T. R., Hawthorne, N. J.
Goodrich Co., B. F., Shelton, Conn.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Kent Mfg. Co., Kent, O.
Johns-Manville, New York, N. Y.
Keldur Div. of Quimby & Co., Chester, N. J.
Korfund Co., Inc., Long Island City, N. Y.
MB Electronics, New Haven, Conn.
National Cork Co., Englewood, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J.
Saussé & Co., M. W., Los Angeles, Calif. (cork; rubber-in-shear)
Spring Packing Corp., Chicago, Ill.
United Cork Companies, Kearney, N. J.
United States Rubber Co., New York, N. Y.
Vibration Eliminator Co., Long Island City, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Voss Engineering, Inc., Chicago, Ill.
Western Felt Works, Chicago, Ill.
Wood Conversion Co., St. Paul, Minn.

BASES, VIBRATION ISOLATING, SPRING TYPE
Barry Controls, Inc., Watertown, Mass.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Korfund Co., Inc., Long Island City, N. Y.
Lord Mfg. Co., Erie, Pa.
Robinson Aviation, Inc., Teterboro, N. J.
Sausse & Co., M. W., Los Angeles, Calif.
Vibration Eliminator Co., Long Island City, N. Y.
Vibration Mountings, Inc., Corona, N. Y.

BEARINGS, BALL
Aetna Ball & Roller Bearing Co., Div. of Parkersburg-Aetna Corp., Chicago, Ill.
Bearings Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., Lancaster, Pa.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
Indus Corp., Indianapolis, Ind.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia, Pa.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Philadelphia, Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Sealmaster Bearings, Div. of Stephen-Adamson Mfg. Co., Aurora, Ill.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, NEEDLE
Andrew Parts Mfg. Co., Long Island City, N. Y.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Roller Bearing Co. of America, West Trenton, N. J.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, PILLOW BLOCK
Anti-Friction Bearings Co., Bell Gardens, Calif.
Boston Gear Works, Quincy, Mass.
Browning Mfg. Co., Maysville, Ky.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Colgate Co., Charles A., Pittsburgh, Pa.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Goldens' Foundry & Machine Co., Columbus, Ga.
Hewitt-Robins Inc., Stamford, Conn.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O.
New Departure Div., General Motors Corp., Bristol, Conn.
Randall Graphite Bearings, Inc., Lima, O.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.

SKF Industries, Inc., Philadelphia, Pa.
Sealmaster Bearings, Div. of Stephens Adamson Mfg. Co., Aurora, Ill.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill. (self-aligning)
Standard Pressed Steel Co., Jenkintown, Pa.
Triangle Mfg. Co., Oshkosh, Wis.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Aetna Ball & Roller Bearing Co., Div. of Parkersburg-Aetna Corp., Chicago, Ill.
Andrew Parts Mfg. Co., Long Island City, N. Y.
Berna Co., A. J., Roseville, Mich.
Chain Belt Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, West Trenton, N. J.
Royersford Foundry & Machine Co. Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill. (self aligning)
Timken Roller Bearing Co., Canton, O.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, SLEEVE

Ampco Metal, Inc., Milwaukee, Wis.
Andrew Parts Mfg. Co., Long Island City, N. Y.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bronze Bearings, Inc., Cranford, N. J.
Cleveland Graphite Bronze, Div. of Clevite Corp., Cleveland, O.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit.
Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., Detroit, Mich.
Gatke Corp., Chicago, Ill.
Haveg Industries, Inc., Wilmington, Del. (plastic)
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Powder Metallurgy, Inc., Ridgway, Pa.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Lau Blower Co., Dayton, O.
Link Belt Co., Chicago, Ill.
Moraine Products Div., General Motors Corp., Dayton, O.
Morganite Inc., Carbon Specialties Div., Long Island City, N. Y.
Morrison Products, Inc., Cleveland, O.
Randall Graphite Bearings, Inc., Lima, O.

BELLOWS, THERMOSTATIC AND METALLIC

American Boa, Inc., New York, N. Y.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Automatic Control Co., St. Paul, Minn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Milford, Conn.
Bristol Co., The, Waterbury, Conn.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Solar Aircraft Co., San Diego, Calif.
Zallea Bros., Wilmington, Del.

BELTING, FLAT, LEATHER

Allen Mfg. Co., W. D., Bellwood, Ill.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Extremultus, Inc., Long Island City, N. Y.
Graton & Knight Co., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., Camden, N. J.
Sikes Co., S. R., Minneapolis, Minn.
Sudbury Laboratory, South Sudbury, Mass.
Williams & Sons, I. B., Dover, N. H.

BELTING, FLAT, PLASTIC

Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Commercial Plastics Co., Chicago, Ill.
Extremultus, Inc., Long Island City, N. Y.
Rhoads & Sons, J. E., Wilmington, Del.
Southern Plastics Co., Columbia, S. C.

BELTING, FLAT, RUBBER

Armstrong Cork Co., Lancaster, Pa.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Gates Rubber Co., The, Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
Mercer Rubber Co., Hamilton Sq., N. J.
New York Belting & Packing Co., Passiac, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.

BELTS, TOOTH-GRIP OR COG

Dayton Rubber Co., Dayton, O.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
New York Belting & Packing Co., Passaic, N. J.
United States Rubber Co., New York, N. Y. (rubber)
Wood's Sons Co., T. B., Chambersburg, Pa.

BELTS, V

America Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Manheim Mfg. & Belting Co., Manheim, Pa.
Maurey Mfg. Corp., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Plummer Mfg. Co., W. A., Los Angeles, Calif.
Pyott Foundry & Machine Co., Aurora, Ill.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Schieren Co., Chas. A., Camden, N. J.
Sikes Co., S. R., Minneapolis, Minn. (leather)
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., East Orange, N. J.
Zatko Metal Products Co., Euclid, O.

BENDERS, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.
American Pipe Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Burr Oak Tool & Gauge Co., Sturgis, Mich.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hein-Werner Corp., Waukesha, Wis.
Hill, Inc., Walter P., Detroit, Mich.
Holsclaw Bros. Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Lenz Co., Dayton, O.
Lidseen of North Carolina, Inc., Hayesville, N. C.
Milton Equipment Co., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Radiant Devices, St. Louis, Mo.
Sac Tool Mfg. Co., St. Louis, Mo.
Senna Mfg. Co., Spokane, Wash.
Vanderman Mfg. Co., Willimantic, Conn.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.

BENDERS, TUBING

Anderson Metals Corp., Kansas City, Mo.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Burr Oak Tool & Gauge Co., Sturgis, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hein-Werner Corp., Waukesha, Wis.
Hill, Inc., Walter P., Detroit, Mich.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Lenz Co., Dayton, O.
Leonard Precision Products Co., Santa Ana, Calif.
Madden Brass Products Co., Aurora, Ill.
Milton Equipment Co., Philadelphia. Pa.
Mueller Brass Co., Port Huron, Mich.
National Pipe Bending Co., New Haven Conn.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Obear & Sons, Inc., Inglewood, Calif.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Piper Industries, Inc., Roseville, Mich.
Republic Steel Corp., Cleveland, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Senna Mfg. Co., Spokane, Wash.
Steel City Electric Co., Pittsburgh, Pa.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.
Wilson Manufacturing Co., Memphis, Tenn.

BENDS, EXPANSION, STEAM PIPE

Atlantic Pipe Bending & Fabricating Corp., Moonachie, N. J.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Durant Insulated Pipe Co., E. Palo Alto, Calif.
Grinnell Co., Inc., Providence, R. I.
Kellogg Co., M. W., The, New York, N. Y.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.

Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Rempe Co., Chicago, Ill.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
Star Tubular Products Co., Chicago, Ill.
Taylor Engineering Corp., Detroit, Mich.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.

BENDS, PIPE, RETURN

Atlantic Pipe Bending & Fabricating Corp., Moonachie, N. J.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Crane Co., Chicago, Ill.
Elkhart Products Corp., Elkhart, Ind.
Gerry Tool Co., Bristol, Conn.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Imeco, Inc., Chicago, Ill.
Kam Products Corp., Brooklyn, N. Y.
Lewis & Saunders, Inc., Lakeport, N. H.
National Pipe Bending Co., New Haven, Conn.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Pittsburgh Nipple Works, Pittsburgh, Pa.
Rittling Corp., The, Buffalo, N. Y.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Star Tubular Products Co., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vilter Mfg. Co., The, Milwaukee, Wis.
Ward Foundries, Inc., J. P., Blossburg, Pa.
Western Piping & Engineering Co., Inc., San Francisco, Calif.

BI-METALS, THERMOSTATIC

American Silver Co., Flushing, N. Y.
Chace Co., W. M., Detroit, Mich.
Engelhard Industries, Inc., Newark, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
Wilson Div., H. A., Engelhard Industries, Union, N. J.

BLADES, PROPELLER FAN

Ackermann Mfg. Co., Subsid. of Wheeling Steel Corp., Wheeling, W. Va.
Aerovent Fan Co., Inc., Piqua, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Alloy Propeller, Zelionople, Pa.
Bertram Co., Harvey P., The, Cincinnati, O.
Broan Mfg. Co., Inc., Hartford, Wis.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Dayton Rubber Co., Dayton, O.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Hudson Engineering Corp., Houston, Tex. (plastic)
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
International Engrg. Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Koppers Co., Inc., Aeromaster Fan Dept., Baltimore, Md.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lakewood Engineering & Mfg. Co., Chicago.
Martin Fan & Blower Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
Meier Electric, Indianapolis, Ind.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Precision Fan Blade Mfg. Co., Div. of Warrington Co., Los Angeles, Calif.
Robinson Ventilating Co., Zelienople, Pa.
Schwitzer Corp., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Torrington Mfg. Co., Torrington, Conn.
Ventco, Inc., Houston, Tex.
Whirlwind Mfg. Co., Houston, Tex.
Wind-Way Fan & Ventilator Co., New Orleans, La.

BLAST GATES

See Gates, Blast

BLAST HEATERS

See Surface, Finned, Heating

BLAST HEATING COILS

See Surface, Finned, Heating

BLINDS, LINE, PIPE

Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Ladish Co., Cudahy, Wis.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Smith-Blair, Inc., South San Francisco, Calif.
Vernon Tool Co., Ltd., Alhambra, Calif.

BLOCKS, TERMINAL, FOR ELECTRICAL CONNECTIONS

Allen-Bradley Co., Milwaukee, Wis.
Cam-Lok Div., Empire Products, Inc., Cincinnati, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Kulka Electric Corp., Mt. Vernon, N. Y.
Marathon Electric Mfg. Corp., Wausau, Wis.
Pyle-National Co., The, Chicago, Ill.
Sealed Unit Parts Co., Inc., New York, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

BLOW PIPE FITTINGS

See Fittings, Blow Pipe

BLOWER FANS

See Fans, Axial Flow; and Fans, Centrifugal

BLOWER HOUSINGS

See Housings, Fan

BLOWER WHEELS

See Wheels, Blower

BLOWERS, HIGH PRESSURE

For Low Pressure Blower Fans, See Fans, Centrifugal

Airfan Engineering Co., Los Angeles, Calif.
American-Standard Industrial Div., Detroit, Mich.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Dayton Electric Mfg. Co., Chicago, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electric Boat Div., General Dynamics Corp., Groton, Conn.
Elliott Co., Jeannette, Pa.
Fluor Products Co., Santa Rosa, Calif.
Gaffers & Sattler, Los Angeles, Calif.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Ilg Electric Ventilating Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (plastic construction for exhaust and corrosive fumes)
Ingersoll-Rand Co., New York, N. Y.
Jan-Air, Inc., Richmond, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Kice Metal Products Co., Wichita, Kans.
Lammert & Mann Co., Chicago, Ill.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
New York Blower Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Engineering Corp., Mingo Jct., O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.
Standard Electric Mfg. Co., West Berlin, N. J.
Sutorbilt Corp., Subsidiary of Fuller Co., Compton, Calif.
Torrington Mfg. Co., The, Torrington, Conn.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Delaware, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

BLOWERS, SOOT

Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayer Co., St. Louis, Mo.
Boiler Equipment Trust, Amherst, Mass.
Chesterton Co., A. W., Everett, Mass.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Diamond Power Specialty Corp., Lancaster, O.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Marion Machine Foundry Inc., Marion, Ind.

BLOW-OFF VALVES

See Valves, Blow-off

BLUE PRINT MACHINES

See Machines, Blue Print and White Print

BOARDS, PANEL AND CONTROL

Ace Engineering Co., Chicago, Ill.
Adam Electric Co., Frank, St. Louis, Mo.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Auto-Control Laboratories, Inc., Inglewood, Calif.
Automatic Control Co., St. Paul, Minn.
Automatic Switch Co., Florham Park, N. J
Barber-Colman Co., Rockford, Ill.
Bailey Meter Co., Cleveland, O.
Better Engineered Controls, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Cleveland Controls, Inc., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Devco Engineering, Inc., Control Systems Div., Caldwell, N. J.
Distribution Equipment Div., Lexington, Ky.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Electro Devices, Inc., Mt. Prospect, Ill.
Falstrom Co., Passaic, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., Michigan City, Ind.
International Business Machines Corp., New York, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Johns-Manville, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Littleford Bros., Inc., Cincinnati, O.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nelson Electric Mfg. Co., Tulsa, Okla.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Powers Regulator Co., Skokie, Ill.
Protection Controls, Inc., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Seton Name Plate Co., New Haven, Conn.
Shallcross Controls, Inc., Markesan, Wis.
Taller & Cooper, Inc., Brooklyn, N. Y.
Trerice Co., H. O., Detroit, Mich.
Webster Engineering Co., Tulsa, Okla.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiddett Co., John C., Drexel Hill, Pa.
Will-Burt Co., Orrville, O.

BOILER BLOWDOWN VALVES

See Valves, Continuous Boiler Blowdown

BOILER CLEANING COMPOUNDS

See Compounds, Boiler Cleaning

BOILER FEED PUMPS

See Pumps, Boiler Feed

BOILER FEEDERS

See Feeders, Water, Heating Boiler

BOILER GAGES

See Gages, Liquid Level

BOILER OBSERVATION PORTS

See Ports, Observation, Boiler

BOILER SEALING COMPOUNDS

See Compound, Boiler and Radiator Sealing

BOILER AND TANK INSULATION

See Insulation, Boiler and Tank

BOILER TUBES

See Tubes, Boiler

BOILER WATER ALARMS

See Alarms, High and Low Boiler Water

BOILERS, ELECTRIC

See Generators, Steam, Electric

BOILERS, HEATING, CAST IRON, SECTIONAL

2000 *Sq Ft Steam Radiation and Over*

Ackerman Gas Boiler Corp., McDonald, Pa.
American-Standard Plumbing & Heating Div., New York, N. Y.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bryant Mfg. Co., Indianapolis, Ind.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Eastern Boiler Co., Hartford, Conn.
Hydrotherm, Inc., Northvale, N. J.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa. (all fuels)
Peerless Heater Co., The, Div. of the Eastern Foundry Co., Boyertown, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Rheem Mfg. Co., Chicago, Ill.
Richmond Plumbing Fixtures Div., Rheem Mfg. Co., Metuchen, N. J.
Smith Co., Inc., H. B., The, Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Weil McLain Co., Michigan City, Ind.

BOILERS, HEATING, STEEL, FIRE TUBE

2000 *Sq Ft Steam Radiation and Over*

Ajax Boiler & Heater Co., Gardena, Calif.
Aldrich Co., Wyoming, Ill.
American-Standard Industrial Div., Detroit, Mich.
Atlantic Steel Boiler Co., Philadelphia, Pa.
Bigelow Co., New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros, Inc., Minneapolis, Minn.
Burnham Corp., Irvington, N. Y.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Erie City Iron Wks., Erie, Pa.
Federal Boiler Co., Inc., Midland Park, N. J.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Gabriel Boiler & Fabrication Co., Portland, Ore.
Hamburg Boiler Works, Inc., Hamburg, Pa.
Hodge Boiler Wks., East Boston, Mass.
Johnston Bros., Inc., Ferrysburg, Mich.
Leffel & Co., James, Springfield, O.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Murray Iron Wks. Co., Burlington, Ia.
National-U. S. Radiator Corp., Johnstown, Pa.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (320 sq ft thru 60710 sq ft)
Patco Mfg. Co., Inc., Philadelphia, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Smith Twin Tubular Boiler Co., Inc., Philadelphia, Pa.
Spencer Heater, Lycoming Division, Avco Corp., Williamsport, Pa.
Stout & Sons, David, St. Louis, Mo.
Struthers Wells Corp., Warren, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Titusville Iron Wks Co., The, Titusville, Pa.
Viking Mfg. Corp., Cleveland, O.
Water Tube Boiler & Tank Co., Chicago, Ill.
Western Boiler Co., Los Angeles, Calif.

BOILERS, HEATING, STEEL, TUBELESS

Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Axeman-Anderson Co., Williamsport, Pa.
Bryant Mfg. Co., Indianapolis, Ind.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N.Y.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
V. & E. Products, Inc., Schuylkill Haven, Pa.
Viking Mfg. Corp. Cleveland, O.
Wescott Snyder Mfg. Corp., Madison, N. J.

BOILERS, HEATING, STEEL, WATER TUBE

Ajax Boiler & Heater Co., Gardena, Cailf.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Anetsberger Bros., Inc., Northbrook, Ill.
Atlantic Steel Boiler Co., Philadelphia, Pa.
Auburn Burner Co., Auburn, Ind.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Boiler Engineering & Supply Co., Phoenixville, Pa. (for high temperature water; 4 to 25 million Btu per hr vertical or horizontal type oil, gas, coal or combination fired)
Bros, Inc., Minneapolis, Minn.
Bryan Steam Corp., Peru, Ind.
Central States Steel Boiler Co., Chicago, Ill.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y.
Erie City Iron Wks., Erie, Pa.
Gibraltar Corp. of America, Brooklyn, N. Y.
Gold Top Heating, Inc., San Gabriel, Calif.
Hercules Power Equipment Co., Los Angeles, Calif.
International Boiler Wks. Co., The, East Stroudsburg, Pa.
Keeler Co., E., Williamsport, Pa.
Murray Iron Wks. Co., Burlington, Ia.
Nebraska Boiler Company, Inc., Lincoln, Nebr.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Queen City Engineering Co., Charlotte, N. C.
Raypak Co., Inc., El Monte, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Riley Stoker Corp., Worcester, Mass.
Rite Engineering & Mfg. Corp., Downey, Calif.
Springfield Boiler Co., Springfield, Ill.
Texsteam Corp., Houston, Tex.
Thermo-Pak Boilers, Inc., Alhambra, Calif. (copper tubes)
Titusville Iron Works Co., The, Titusville, Pa.
V. & E. Products, Inc., Schuylkill Haven, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
Water Tube Boiler & Tank Co., Chicago, Ill.
Wescott Snyder Mfg. Corp., Madison, N. J.
Wickes Boiler Co., Saginaw, Mich.
Zingheim Co., William C., Chicago, Ill.

BOILERS, PACKAGED UNITS, HEATING AND PROCESS—*Including Controls, Feed Pump, etc.*

Ackerman Gas Boiler Corp., McDonald, Pa. (gas fired steam & water, 72,000 Btu to 1,500,000 Btu)
Ajax Boiler & Heater Co., Gardena, Calif.
American-Standard Industrial Div., Detroit, Mich.
American-Standard Plumbing & Heating Div., New York, N. Y. (gas and oil fired)
Ames Iron Works, Inc., Oswego, N. Y. (10 to 600 bhp)
Atlantic Steel Boiler Co., Philadelphia, Pa. (20 to 125 hp; gas and oil)
Axeman-Anderson Co., Williamsport, Pa. (coal & oil)
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bethlehem Foundry & Machine Co., Bethlehem, Pa. (1.0 to 3.5 gph)
Bigelow Co., The, New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Boiler Engineering & Supply Co., Phoenixville, Pa. (20 to 600 Hp, 15 to 250 psi oil-gas or combination fired)
Bros Inc., Minneapolis, Minn.
Bryan Steam Corp., Peru, Ind. (4 to 50 hp, 15 to 125 psi gas and oil)
Clayton Mfg. Co., El Monte, Calif. (15-160 hp; 65-300 psi; gas, oil, and combination)
Cleaver-Brooks Co., Milwaukee, Wis. (oil-gas: 15-60 hp; CB: 15-350 hp; LR: 400-600 hp; oil, gas and combination oil-gas)
Columbia Boiler Co. of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y. (4,000 lb/Hr to 90,000 lb/Hr)
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edwards Engineering Corp., Pompton Plains, N. J. (100,000 to 600,000 Btu per hr; gas and oil)
Erie City Iron Works, Erie, Pa.
Fitzgibbons Boiler Co., Inc., New York, N. Y. (oil; oil and gas)
Foster Wheeler Corp., New York, N. Y.
Gabriel Boiler Co., Portland, Ore. (3-500 HP)
Hodge Boiler Wks., East Boston, Mass.
Hydrotherm, Inc., Northvale, N. J.
International Boiler Works Co., East Stroudsburgh, Pa.
Iron Fireman Mfg. Co., Cleveland, O. (up to 550 bhp gas, oil, dual-fuel)
Johnston Bros., Inc., Ferrysburg, Mich.
Keeler Co., E., Williamsport, Pa.
Kisco Boiler & Engineering Co., St. Louis.
Laars Engineers, North Hollywood, Calif.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Leffel & Co., James, Springfield, O.
Littleford Bros., Inc., Cincinnati, O.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn. (3 hp thru 80 hp — oil or gas)
Malsbary Mfg. Co., Oakland, Calif.
Martin Co., Inc., J. O., San Francisco, Calif.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Murry Iron Works Co., Burlington, Ia.
National-U. S. Radiator Corp., Johnstown, Pa. (20-60 hp; gas and oil)
Nebraska Boiler Co., Inc., Lincoln, Nebr.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (320 sq ft thru 60,710 sq ft oil or gas 15 psig steam, 30 psig water)
Pantex Mfg. Corp., Pawtucket, R. I.
Parker Boiler Mfg. Co., Sid E., Los Angeles Calif. (1½ Hp - 150 Hp. Pressure to 200 psi. Gas, oil and combination firing)

Petro, Cleveland, O. (up to 450 hp gas, oil and combination; high pressure)
Preferred Utilities Mfg. Corp., New York. (20 to 600 boiler hp. Design pressure from 15 to 250 psi. All grades of oil and gas or combination gas and oil)
Queen City Engineering Co., Charlotte, N. C. (300 to 17,500 lb of steam per hr; to 250 psi)
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Rite Engineering & Mfg. Corp., Downey, Calif.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O. (114,000 to 1,000,000 Btu gas or oil)
Sellers Engineering Co., Chicago, Ill.
Springfield Boiler Co., Springfield, Ill. (12,000 to 75,000 lb per hr, 200 to 900 psig, gas & oil fired)
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind. (300 to 970 Sq ft steam; 555 to 1555 sq ft water)
Stout & Sons, David, St. Louis, Mo. (up to 420,000 sq ft EDR; up to 400 psig; gas and oil fuels)
Struthers Wells Corp., Warren, Pa.
Superior Combustion Industries, Inc., New York, N. Y. (fire tube 20-600 hp to 250 psi, oil, gas or both; water tube 4000 to 61,000 lb per hr., oil, gas or both)
Terre Haute Boiler Works Co., Terre Haute, Ind. (15 to 600 hp; 15 to 200 psi, steam)
Texsteam Corp., Houston, Tex.
Titusville Iron Works Co., The, Titusville, Pa.
Turb-O-Heat, Inc., Brooklyn, N. Y.
Union Iron Works, Erie, Pa.
Vapor Heating Corp., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky. (10,000 to 50,000 lb of steam per hr capacities)
Way-Wolff Associates, Inc., Long Island City, N. Y.
Wescott Snyder Mfg. Corp., Madison, N. J. (oil & gas)
Western Boiler Co., Los Angeles, Calif.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOILERS, PORTABLE, STEAM FOR STEAM CLEANING, MISCELLANEOUS PROCESS, OTHER USES

Bros, Inc., Minneapolis, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Lattner Mfg. Co., P. M., Cedar Rapids, Ia.
Leffel & Co., James, Springfield, O.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Nebraska Boiler Co., Inc., Lincoln, Nebr.
Pantex Mfg. Corp., Pawtucket, R. I.
Texsteam Corp., Houston, Tex.
Turb-O-Heat, Inc., Brooklyn, N. Y.
Vapor Heating Corp., Chicago, Ill.
Western Boiler Co., Los Angeles, Calif.

BOLTS, EXPANSION

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Harper Co., H. M., Morton Grove, Ill.
Holub Industries, Inc., Sycamore, Ill.
Industrial Screw Co., Chicago, Ill.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
National Lead Co., New York, N. Y.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Republic Steel Corp., Cleveland, O.
Star Expansion Industries Corp., Mountainville, N. Y.
U. S. Expansion Bolt Co., York, Pa.

BOLTS AND STUDS, FLANGE

Abbott Products, Inc., Whitestone, N. Y.
Anti-Corrosive Metal Products Co., Inc., Castleton-On-Hudson, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Clark Bros. Bolt Co., Milldale, Conn.
Continental Screw Co., New Bedford, Mass.
Erie Bolt & Nut Co., Erie, Pa.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Harper Co., H. M., Morton Grove, Ill.
Haskell Mfg. Co., Wm. H., Pawtucket, R. I.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
Mac-Lean-Fogg Lock Nut Co., Chicago, Ill.
Parker Seal Co., Culver City, Calif.
Pheoll Mfg. Co., Inc., Chicago, Ill.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Victor Products Corp., Chicago, Ill.

BOLTS, TOGGLE AND ANCHOR

Arro Expansion Bolt Co., Marion, O.
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Clark Bros. Bolt Co., Milldale, Conn.
Crawford Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Elcen Metal Products Co., Franklin Park, Ill.
Fastway Fasteners, Inc., Lorain, O.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Holub Industries, Inc., Sycamore, Ill.
Huck Mfg. Co., Detroit, Mich.
Industrial Screw Co., Chicago, Ill.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Modern Hanger Corp., The, Cleveland, O.
Moore, Inc., Goodloe E., Danville, Ill.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Republic Steel Corp., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Star Expansion Industries Corp., Mountainville, N. Y.
U. S. Expansion Bolt Co., York, Pa.
Western Wire Products Co., St. Louis, Mo (flattened lag)

BOLTS, "U"

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Clark Bros. Bolt Co., Milldale, Conn.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Harper Co., H. M., Morton Grove, Ill.
Lamson & Sessions Co., The, Cleveland, O.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Modern Hanger Corp., The, Cleveland, O.
Republic Steel Corp., Cleveland, O.
Steel City Electric Co., Pittsburgh, Pa.
U. S. Expansion Bolt Co., York, Pa.

BOOSTER TRANSFORMERS

See Transformers, Boost and Buck

BOOSTERS, GAS

Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Haskel Engineering & Supply Co., Glendale, Calif.
Joy Mfg. Co., Pittsburgh, Pa.
Leiman Bros., Inc., Newark, N. J.
North American Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower, Div. of Dresser Industries, Inc, Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.

BOOTHS, PAINTING, SPRAY

Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Baltimore, Md.
Burdett Mfg. Co., Chicago, Ill.
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (wet type)
David-Ludwig Co., Detroit, Mich.
DeVilbiss Co., The, Toledo, O.
DeVilbiss Metal Fabricators Co., Detroit, Mich.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Kirk & Blum Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
M & E Mfg. Co., Indianapolis, Ind.
Mahon Co., R. C., The, Detroit, Mich.
Newcomb-Detroit Co., Detroit, Mich.
Plummer Spray Equipment Co., Napolean, O.
Ramco Equipment Corp., New York, N. Y.
Spray Engineering Co., Burlington, Mass.
United Sheet Metal Co., Inc., Columbus, O.
Young & Bertke Co., Cincinnati, O.
Zack Co., The, Chicago, Ill.

BRAKES, SHEET METAL, HAND

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Works, Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis, Mo.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, PORTABLE

Auburn Machine Works, Inc., Auburn, Neb.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn
Dreis & Krump Mfg. Co., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, POWER

Bath Co., Cyril, The, Solon, O.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Diamond Machine Tool Co., Pico, Calif.
Dreis & Krump Mfg. Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Verson Allsteel Press Co., Chicago, Ill.
Verson Mfg. Co., The, Dallas, Tex.
Whitney Metal Tool Co., Rockford, Ill.
Wilson Co., K. R., Arcade, N. Y. (Hydraulic)

BRASS PIPE

See Pipe, Brass and Copper

BRASS TUBING

See Tubing, Brass and Copper

BRASS UNIONS

See Unions, Brass

BRASS VALVES

See Valves, Gate; and Valves, Globe

BRAZING ALLOYS

See Solder (Silver), Brazing Alloys and Fluxes

BRAZING TORCHES

See Torches, Brazing

BREAKERS, VACUUM (For Steam Using Equipment)

Associated Valve Co., North Wales, Pa.
Bailey Co., Chas. M., San Francisco, Calif.

Foster Engineering Div., General Controls Co., Warwick, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
McAlear Mfg. Co., Chicago, Ill.
OPW-Jordan, Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.

BRONZE VALVES

See Valves, Gate; and Valves, Globe

BUILDING INSULATION

See Insulation, Building

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

Adams Mfg. Co., Cleveland, O.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Aston Products, Inc., Warren, Mich.
Auburn Burner Co., Edgerton, O.
Auburn Foundry Inc., Heating Div., Auburn, Ind.
Babcock & Wilcox Co., The, Boiler Div., New York, N. Y.
Barber Mfg. Co., Cleveland, O.
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Bryant Mfg. Co., Indianapolis, Ind.
Burdett Mfg. Co., Chicago, Ill.
Century Engineering Corp., Cedar Rapids, Ia.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Cox Mfg. Co., Ridgeville, Ind.
Dalzen Mfg. Co., St. Clair, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Norristown, Pa.
Forney Engineering Co., Dallas, Tex.
Fuelguard Co., Dallas, Tex.
Gold Top Heating, Inc., San Gabriel, Calif.
Gordon & Piatt, Inc., Winfield, Kan.
Haney Burner Div., Southwest Gas Corp., Las Vegas, Nev.
Hastings Air Control, Inc., Omaha, Nebr.
Hauck Mfg. Co., Brooklyn, N. Y.
Industrial Combustion, Inc., Milwaukee, Wis.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Co., S. T., Oakland, Calif.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnston Bros., Inc., Ferrysburg, Mich.
Laharco Industries, Minneapolis, Minn.
Lattner Mfg. Co., P. M., Cedar Rapids, Ia.
Leahy Mfg. Co., Los Angeles, Calif.
Leffel & Co., James, The, Springfield, O.
Lennox Industries, Inc., Marshalltown, Ia.
Liberty Combustion Corp., Syracuse, N. Y.
Lientz Co., B. P., Kansas City, Mo.
Martin Co., Inc., J. O., San Francisco, Calif.
Maxon Premix Burner Co., Muncie, Ind.
Mid-Continent Metal Products Co., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia Pa.
Norman Products Co., Inc., Columbus, O.
North American Mfg. Co., Cleveland, O.
Nu-Way Corp., The, Rock Island, Ill.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engrg. Corp., New York, N. Y.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Petro, Cleveland, O.
Power-Flame Div., Inc., Grandview, Mo.
Radiant Heat & Cooling Co., Santa Clara, Calif.
Ransome Torch & Burner Co., Emeryville, Calif.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Reif-Rexoil, Inc., Buffalo, N. Y.
Research Vacuum Supply Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Schurs Oil Burner Co., Los Angeles, Calif.
Selas Corp. of America, Dresher, Pa.
Sellers Engineering Co., Chicago, Ill.
Sonner Burner Co., Winfield, Kan.
Standard Fuel Engineering Co., Detroit, Mich.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Utah Hydro Corp., Salt Lake City, Utah.
Vacuum Gas Burner Co., Olean, N. Y.
Wayne Home Equipment Co., Inc., Ft. Wayne, Ind.
Webster Engineering Co., Tulsa, Okla.
Wickes Boiler Co., The, Saginaw, Mich.
Wisconsin Burners Inc., Madison, Wis.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.
Zurn Industries, Inc., Erie, Pa.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL, COMBINED WITH STOKER OR OVER COAL GRATES

Barber Mfg. Co., Cleveland, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Leffel & Co., James, The, Springfield, O.
Lientz Co., B. P., Kansas City, Mo.
Maxon Premix Burner Co., Muncie, Ind.
Mid-Continent Metal Products Co., Chicago, Ill.
Norman Products Co., Columbus, O.
Orr & Sembower, Inc., Reading, Pa.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Utah Hydro Corp., Salt Lake City, Utah
Webster Engineering Co., Tulsa, Okla.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Norristown, Pa.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Hauck Mfg. Co., Brooklyn, N. Y.
Industrial Combustion, Inc., Milwaukee, Wis.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Johnson Co., S. T., Oakland, Calif.
Johnston Bros., Inc., Ferrysburg, Mich.
Lammert & Mann Co., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Leffel & Co., James, The, Springfield, O.
Lientz Co., B. P., Kansas City, Mo.
Mid-Continent Metal Products Co., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National-U. S. Radiator Corp., Johnstown, Pa.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Power-Flame Div., Inc., Grandview, Mo.
Preferred Utilities Mfg. Corp., New York
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Stafico Burner Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Co., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Simplex Oil Heating Corp., Philadelphia, Pa.
Sonner Burner Co., Winfield, Kan.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Utah Hydro Corp., Salt Lake City, Utah
Webster Engineering Co., Tulsa, Okla.
Wickes Boiler Co., The, Saginaw, Mich.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.

BURNERS, NATURAL AND LP GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill.
American-Standard Plumbing & Heating Div., New York, N. Y.
Babcock & Wilcox Co., The, Boiler Div., New York, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Century Engineering Corp., Cedar Rapids, Ia.
Eclipse Fuel Engineering Co., Rockford, Ill.
Gold Top Heating, Inc., San Gabriel, Calif.
Gordon & Piatt, Inc., Winfield, Kans.
Hauck Mfg. Co., Brooklyn, N. Y.
Industrial Combustion, Inc., Milwaukee, Wis.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Leffel & Co., James, The, Springfield, O.
Maxon Premix Burner Co., Muncie, Ind.
Mid-Continent Metal Products Co., Chicago, Ill.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
Norman Products Co., Inc., Columbus, O.
Orr & Sembower, Inc., Reading, Pa.
Power-Flame Div., Inc., Grandview, Mo.
Ransome Torch & Burner Co., Emeryville, Calif.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Sonner Burner Co., Winfield, Kans.
Stout & Sons, David, St. Louis, Mo.
Synchronous Flame, Inc., Walworth, Wis.
Utah Hydro Corp., Salt Lake City, Utah

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

ABC-Federal Oil & Burner Co., Inc., Philadelphia, Pa. (rotary)
Ace Engineering Co., Chicago, Ill. (Rotary)
Aldrich Co., Wyoming, Ill.
American-Standard Plumbing & Heating Div., New York, N. Y.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Automatic Burner Corp., Chicago, Ill. (high pressure)
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Beckett Corp., R. W., Elyria, O. (high pressure)
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Carlin Co., The, Wethersfield, Conn.
Century Engrg. Corp., Cedar Rapids, Ia. (high pressure atomizing)
Coen Co., San Francisco, Calif.
Columbia Boiler Co. of Pottstown, Pottstown, Pa.
Drying System Co., Chicago, Ill. (medium pressure atomizing)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eds-Wil Burner Corp., Chicago, Ill.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J. (high pressure atomizing)
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif. (rotary)
Faber Engineering Co., Inc., Norristown, Pa.
Forney Engineering Co., Dallas, Tex. (both steam atomizing & mechanical, high pressure)
Gilbert & Barker Mfg. Co., West Springfield, Mass. (high pressure atomizing)
Haney Burner Div., Southwest Gas Corp., Las Vegas, Nev. (steam atomizing)
Hardinge Oil Burner & Mfg. Co., Chicago, Ill.
Hauck Mfg. Co., Brooklyn, N. Y. (low pressure air type and high pressure steam type)
Industrial Combustion, Inc., Milwaukee, Wis. (low pressure air atomizing sizes from 1 to 150 gph and 720,000 to 21,000,000 max.

Btu gas input per hr. For boilers up to 480 hp)
Iron Fireman Mfg. Co., Cleveland, O. (Rotary atomizing, high pressure atomizing)
Jackson & Church Co., Saginaw, Mich.
Johnson Co., S. T., Oakland, Calif. (high pressure atomizing; horizontal rotary)
Johnston Bros., Inc., Ferrysburg, Mich.
Kol-Master Corp., Oregon, Ill. (high pressure)
Kresky Mfg. Co., Inc., Petaluma, Calif. (hi-pressure atomizing; also forced-draft vaporizing retort-type)
Lammert & Mann Co., Chicago, Ill. (low pressure air or steam atomization)
Leahy Mfg. Co., Los Angeles, Calif.
Leffel & Co., James, The, Springfield, O.
Lennox Industries, Inc., Marshalltown, Ia. (high pressure)
Lientz Co., B. P., Kansas City, Mo. (steam atomizing)
Maxon Premix Burner Co., Muncie, Ind. (low pressure)
Montag Inc., Portland, Ore.
National Airoil Burner Co., Inc., Philadelphia, Pa. (low pressure, high pressure, steam rotary)
National Oil Burner Co. of N. Y. Inc., Brooklyn, N. Y. (horizontal rotary)
North American Mfg. Co., Cleveland, O. (low & high pressure atomizing; steam atomizing; variable capacity)
Nu-Way Corp., The, Rock Island, Ill.
Orr & Sembower, Inc., Reading, Pa. (air-atomizing) (Capacity range: 15 hp-500 hp. Fuels: Light oil, heavy oil or gas or any combination of these.)
Peabody Engrg. Corp., New York, N. Y.
Petro, Cleveland, O. (high pressure and rotary atomizing)
Preferred Utilities Mfg. Corp., New York, N. Y., **(Rotary types; from 7½ gph to 175 gph.)**
Quiet Automatic Oil Burner Corp., Newark, N. J. (up to 24 gph)
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif. (High pressure atomizing and rotary)
Rayfield-Staffco Burner Co., Chicago, Ill. (low pressure atomizing and horizontal rotary)
Reif-Rexoil, Inc., Buffalo, N. Y. (high pressure atomizing .50 to 30 gph. No. 2 oil plus horizontal rotary heavy oil from 2 to 165 gph.)
Riley Stoker Corp., Worcester, Mass.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silent Automatic Products, Cleveland, O. (high pressure atomizing, 3-30 gal per hr)
Silent Glow Oil Burner Co., Hartford, Conn. (high pressure atomizing)
Simplex Oil Heating Corp., Philadelphia, Pa. (Low and high pressure atomizing, and horizontal rotary types)
Staples & Pfeiffer, San Francisco, Calif. (High pressure and steam atomizing, variable capacity)
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind. (low pressure)
Stout & Sons, David, St. Louis, Mo.
Sun-Ray Burner Mfg. Corp., Jamaica, N. Y. (high pressure)
Superior Combustion Industries, Inc., New York, N. Y. (rotary)
Synchronous Flame, Inc., Walworth, Wis. (High pressure atomizing)
Todd Shipyards Corp., Products Div., Brooklyn, N. Y. (Variable capacity, rotary, pressure atomizing, steam atomizing)
Utah Hydro Corp., Salt Lake City, Utah
Wayne Home Equipment Co., Inc., Ft. Wayne, Ind. (high pressure)
Weatherall Engineers, Inc., Providence, R. I.
Webster Engineering Co., Tulsa, Okla.
Wickes Boiler Co., The, Saginaw, Mich. (steam atomizing)
Wisconsin Burners Inc., Madison, Wis.
York-Shipley, Inc., York, Pa. (Rotary, high pressure atomizing)
Zink Co., John, Tulsa, Okla.

BURNERS, PULVERIZED COAL, COMMERCIAL AND INDUSTRIAL

American Coal Burner & Wood Stoker Corp., Chicago, Ill.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Combustion Engineering Inc., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Whiting Corp., Harvey, Ill.

BURNERS, PULVERIZED COAL AND GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Combustion Engineering Inc., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Combustion Engineering Inc., New York, N. Y.
Engineer Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL AND OIL, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Combustion Engineering Inc., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

CABINETS FOR AIR CONDITIONERS, BOILERS, ETC.

See Parts For Heating and Air Conditioning Equipment

CABLE, ELECTRIC HEATING

Ceilheat, Inc., Knoxville, Tenn.
Chester Cable Corp., Chester, N. Y.
Cox & Co., Inc., New York, N. Y.
Dixie Raydiant Electric Heat Corp., Atlanta, Ga.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Everwarm, Inc., Knoxville, Tenn.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
General Electric Co., Wiring Device Dept., Providence, R. I.
Meier Electric, Indianapolis, Ind.
Miller Mfg. Co., St. Paul, Minn.
Modernheat Cable Corp., Kingsport, Tenn.
Nelson Electric Mfg. Co., Tulsa, Okla.
Preferred Utilities Mfg. Corp., New York, N. Y.
Radiant Electric Heat Co., Springfield, Ill.
Rentip, Inc., Knoxville, Tenn.
Roberson Inc., Seattle, Wash.
S & C Mfg. Co., Cincinnati, O.
Sunwarm, Inc., Kingsport, Tenn.
Tennessee Plastics, Inc., Johnson City, Tenn.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

CABLE AND WIRE, THERMOSTAT

Chester Cable Corp., Chester, N. Y.
Gavitt Wire & Cable Co., Div. of Amerace Corp., Brookfield, Mass.
General Controls Co., Glendale, Calif.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Roberson Inc., Seattle, Wash.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CALCULATORS, AIR CONDITIONING, HEATING, VENTILATING, AND PIPING; SLIDE RULE

Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md. (psychrometric calculator)
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O.
Calculator Specialties Co., Chicago, Ill.
Caliputer, Rancho Sante Fe, Calif.
Graphic Calculator Co., Chicago, Ill.
Morton Engineering Service, Paul S., Kalamazoo, Mich. (Btu calculator, area and volume calculator. Area and crackage calculator, Btuh calculator. Heat loss calculation & data sheets — padded. Electrical heat load, air ducts. Payroll tax calculator and interest calculator.)

CANOPIES, METAL, SUN, REFLECTING

Air Control Products, Inc., Coopersville, Mich.
American Warming & Ventilating Co., Toledo, O.
Bridgeport Brass Co., Hunter Douglas Div., New York, N. Y.
Childers Mfg. Co., Houston, Tex.
Construction Specialties, Inc., Cranford, N. J.
Kawneer Co., Niles, Mich.
Russell Co., F. C., The, Columbiana, O.

CAPACITORS, ELECTRICAL, FOR POWER FACTOR CORRECTION

Aerovox Corp., New Bedford, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Capacitor Dept., Ft. Edward, N. Y.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
Marathon Electric Mfg. Corp., Wausau, Wis.
Potter Co., The, North Chicago, Ill.
Sangamo Electric Co., Springfield, Ill.
Sprague Electric Co., North Adams, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

CAPILLARY TUBING

See Tubing, Capillary, for Refrigerants

CAPS, VENT FLUE

Accurate Sheet Metal & Mfg. Works, Inc., Chicago, Ill.
Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Iowa
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Airjet Ventilator Co., San Clemente, Calif.
Ammerman Co., Inc., Stillwater, Minn.
Binks Mfg. Co., Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Breidert Co., G. C., San Fernando, Calif.
Champion Furnace Pipe Co., Peoria, Ill.
Corbman Bros., Inc., Philadelphia, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Inland Steel Products Co., Milwaukee, Wis.
Leslie Welding Co., Inc., Chicago, Ill.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Ohio Foundry & Mfg. Co., Steubenville, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penn Ventilator Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Robinson Clay Products Co., The, Akron, O.
Tesco, Inc., Tulsa, Okla.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Waverly Heating Supply Co., Beverly, Mass.
Wood Mfg. Co., A. R., Luverne, Minn.

CARBON DIOXIDE ANALYZERS

See Analyzers, Carbon Dioxide, Portable

CARBON DIOXIDE INDICATORS

See Indicators, Carbon Dioxide, Boiler Room

CARBON MONOXIDE DETECTORS

See Detectors, Carbon Monoxide

CARBON PIPE, TUBING, FITTINGS AND VALVES

See Pipe, Tubing, Fittings and Valves, Carbon and Graphite

CAST IRON PIPE
See Pipe, Cast Iron

CATALOG HOLDERS AND FILES
See Holders and Files, Catalog, for Engineers' and Contractors' Offices

CEILINGS, RADIANT, HEATING AND COOLING, AND ACOUSTICAL CONTROL
Also see Coils and Panels, Radiant Heating and Cooling, Prefabricated

Airtex Corp., Chicago, Ill.
Burgess-Manning Co., Architectural Products Div., Libertyville, Ill.
Simplex Ceiling Corp., New York, N. Y.

CEMENT AND COMPOUNDS, PIPE JOINT
Acorn Refining Co., Cleveland, O.
American Sealants Co., Hartford, Conn.
Arco Co., The, Cleveland, O.
Armite Laboratories, Los Angeles, Calif.
Atlas Mineral Products Co., Mertztown, Pa.
Babbitt Chemical Co., New Bedford, Mass.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Baso, Inc., Milwaukee, Wis.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Black & White Chemical Co., New York, N. Y.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., Roselle Park, N. J.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Crane Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Croll & Son, Jesse G., Philadelphia, Pa.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Fibercast Co., Sand Spring, Okla.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gasoilair Equipment Co., New Haven, Conn.
Gilbreth Co., The, Philadelphia, Pa.
Goodrich Industrial Products Co., B. F., Akron, O.
Greene, Tweed & Co., North Wales, Pa.
Grinnell Co., Inc., Providence, R. I.
Hercules Chemical Co., Inc., New York, N. Y.
Highside Chemicals, Inc., Clifton, N. J.
Horn Companies, A. C., Subsidiary of Sun Chemical Corp., New York, N. Y.
Industrial Plastic Fabricators, Norwood, Mass.
Jet-Lube, Inc., Burbank, Calif.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Madison, N. J.
Lake Chemical Co., Chicago, Ill.
Macksons Co., New York, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Moran Paint Co., Xenia, O.
Nebel Mfg. Co., Cleveland, O.
Pecora Inc., Philadelphia, Pa.
Permatex Co., Inc., Long Island, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Rectorseal Div., Rector Well Equipment Co., Houston, Tex.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Schwartz Chemical Co., Inc., Long Island City, N. Y. (for joining plastic pipe)
Sexauer Mfg. Co., Inc., J. A., New York, N. Y.
Smooth-On Mfg. Co., Jersey City, N. J.
Spring Packing Corp., Chicago, Ill.
Sulflo, Inc., Elizabeth, N. J.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (UPVC pipe)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Whitlam Mfg. Co., J. C., Wadsworth, O.
Wilhelm Co., A., Reading, Pa.
X Laboratories, Inc., New York, N. Y.
X-Pando Corp., Long Island City, N. Y.

CEMENT, FURNACE
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)
Dixon Crucible Co., Joseph, Jersey City, N. J.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Hercules Chemical Co., Inc., New York, N. Y.
Johns-Manville, New York, N. Y.
Lastik Paint, Inc., Pittsburgh, Pa.
Nebel Mfg. Co., Cleveland, O.
Nicolet Industries, Inc., Hamilton, O.
Norton Co., Worcester, Mass.
Pecora Inc., Philadelphia, Pa.
Plastic Products Co., Detroit, Mich.
Plibrico Co., Chicago, Ill.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Roto Corp., Walled Lake, Mich.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Smooth-On Mfg. Co., Jersey City, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.

CEMENT, INSULATING
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Atlas Mineral Products Co., Mertztown, Pa.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa. (mineral wool)
Bigelow Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Columbia Cement Co., Brooklyn, N. Y.
Eagle-Picher Co., Cincinnati, O.
Forty-Eight Insulations, Inc., Aurora, Ill.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (85 per cent magnesia)
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Moore, Inc., Goodloe E., Danville, Ill.
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Nicolet Industries, Inc., Hamilton, O.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
North American Asbestos Corp., Chicago, Ill.
Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., San Francisco, Calif. (85% magnesia)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York.
Rex Clay Products Co., Detroit, Mich.
Ruberoid Co., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
Sauereisen Cements Co., Pittsburgh, Pa.
Smith & Kanzler Corp., Linden, N. J.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
United States Mineral Wool Co., Stanhope, N. J.
Zonolite Co., Chicago, Ill.

CENTRIFUGAL PUMPS
See Pumps, Centrifugal

CERAMIC PIPE
See Pipe, Stoneware

CHAIN DRIVES
See Drives, Chain

CHAMBERS, COMBUSTION, PREFORMED
Armstrong Cork Co., Lancaster, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Bemco, Inc., North Hollywood, Calif.
Boston Machine Works Co., Lynn, Mass.
France Refractories Co., J. H., Snow Shoe, Pa.
Gem Clay Forming Co., Sebring, O.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Lindy Heaters, Inc., New York, N. Y.
Monogram Products Co., Inc., Philadelphia, Pa.
Oil Equipment Mfg. Corp., New Haven, Conn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
Rex Roto Corp., Walled Lake, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Shenango Refractories, New Castle, Pa.

CHAMBERS, TEST, CONTROLLED TEMPERATURE AND HUMIDITY
American Instrument Co., Inc., Silver Spring, Md.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anetsberger Brothers, Inc., Northbrook, Ill.
Drying Systems Co., Chicago, Ill.
Galloway Co., G. W., Arcadia, Calif.
Reco Products Div., Recony Corp., New York, N. Y.
Tenney Engineering, Inc., Union, N. J.
Thompson Research & Mfg. Co., Davenport, Fla.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

CHANGERS, SPEED, HYDRAULIC COUPLING
American-Standard Industrial Div., Detroit, Mich.
Link-Belt Co., Chicago, Ill.
Twin Disc Clutch Co., Rockford, Ill.

CHANGERS, SPEED, MAGNETIC
Allis Co., Louis, The, Milwaukee, Wis.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Janette Electric Mfg. Co., Morton Grove, Ill.

CHANGERS, SPEED, MECHANICAL
Abart Gear & Machine Co., Chicago, Ill.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Boston Gear Works, Quincy, Mass.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
Custanite Corp., Brooklyn, N. Y.
DoAll Co., The, Des Plaines, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Doerr Electric Corp., Cedarburg, Wis.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Horton Mfg. Co., Inc., Minneapolis, Minn.
Lewellen Mfg. Co., Columbus, Ind.
Lima Electric Motor Co., Inc., The, Lima, O.
Link Belt Co., Chicago, Ill.

Lovejoy Flexible Coupling Co., Chicago, Ill.
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Maurey Mfg. Corp., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Corp., Philadelphia, Pa.
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Reliance Electric & Engineering Co., Cleveland, O. (electrical & mechanical drives)
Speed Selector Inc., Chagrin Falls, O.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Woods Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., East Orange, N. J.
Zurn Industries, Inc., Erie, Pa. (synchronizing friction clutch)

CHARGING PANEL FOR REFRIGERANTS

See Pumps, Refrigerant Transfer

CHASERS, PIPE AND BOLT

Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Wickliffe, O.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHASERS, THREADING DIE

Airserco Mfg. Co., Pittsburgh, Pa.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Erie Tool Works, Erie, Pa.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Wickliffe, O.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Snap-on Tools Corp., Kenosha, Wis.
Toledo Pipe Threading Machine Co., Toledo, O.

CHECK VALVES

See Valves, Check

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

Acme Industries, Inc., Jackson, Mich.
Alstrom Corp., New York, N. Y.
American Coils Co., Farmingdale, N. J.
American-Standard Industrial Div., Detroit, Mich.
Arkla Air Conditioning Corp., Little Rock, Ark.
Armstrong Co., Richard M., West Chester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dole Refrigerating Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Ellis & Watts Products, Inc., Cincinnati, O.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Hydrotherm, Inc., Northvale, N. J.
I.C.E.D., Inc., St. Petersburg, Fla.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
King Zeero Co., The, Chicago, Ill.
National-U.S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Peerless of America, Inc., Chicago, Ill.
Process Engineering, Inc., Methuen, Mass.
Reco Products Div., Recony Corp., New York, N. Y.
Schancke, Inc., Evansville, Ind.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Dept HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Typhoon Heat Pump Co., Div. of Hupp Corp., Tampa, Fla.
Vic Mfg. Co., Minneapolis, Minn.
Vilter Mfg. Co., The, Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
Weather King of Florida, Inc., Orlando, Fla.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., W. Hartford, Conn.
Worthington Corp., East Orange, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Yula Corp., Bronx, N. Y.

CHILLERS, WATER, PACKAGED

See Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections and Controls

CHIMNEYS, PREFABRICATED

See Stacks and Chimneys, Industrial, Prefabricated

CHLORINATORS, WATER

American Sanitary Mfg. Co., Abingdon, Ill.
Aquatrol Ferr-X Corp., Clifton, N. J.
Bruner Corp., Milwaukee, Wis.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Clayton Mark & Co., Evanston, Ill.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Radiant Utilities Corp., Brooklyn, N. Y.
Sparkler-Filtrion Corp., North Chicago, Ill.
Uniflow Mfg. Co., Erie, Pa.
Wallace & Tiernan Inc., Belleville, N. J.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

Bell & Gossett Co., Morton Grove, Ill.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Works Co., Columbus, O.
Dayton Electric Mfg. Co., Chicago, Ill.
Dunham-Bush, Inc., Hartford, Conn.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Federal Pump Corp., Brooklyn, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Kam Products Corp., Brooklyn, N. Y.
Kraissl Co., Inc., The, Hackensack, N. J.
Metalmaster Corp., Newark, N. J.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Stout & Sons, David, St. Louis, Mo.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.
Weil Pump Co., Chicago, Ill.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.

CLAMPS, BEAM, DUCT HANGING

Elcen Metal Products Co., Franklin Park, Ill.
Tinnerman Corp., George A., Cleveland, O.

CLAMPS, BEAM, PIPE HANGING

Basic Engineers, Inc., Sharpsburg, Pa.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Crawford Co., Chicago, Ill.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Providence, R. I.
Holub Industries, Inc., Sycamore, Ill.
Industrial Tubular Equipment Co., North Hollywood, Calif.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Minerallac Electric Co., Chicago, Ill.
Modern Hanger Corp., The, Cleveland, O.
Moore, Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Corp., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Paine Co., Addison, Ill.
Rockwood Sprinkler Co., Worcester, Mass.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.

CLAMPS, HOSE AND TUBING

Allen Mfg. Co., W. D., Bellwood, Ill.
Band-It Co., Denver, Colo.
Binks Mfg. Co., Chicago, Ill.
Breeze Corporations, Inc., Union, N. J.
Chicago Pneumatic Tool Co., New York, N. Y.
Circle Clamp Div., Cuyahoga Products Corp., Cleveland, O.
Commercial Plastic Co., Chicago, Ill.
Continental Rubber Wks., Erie, Pa.
Corbin Hose Clamp Div., American Hardware Corp., New Britain, Conn.
Flexible Tubing Corp., Guilford, Conn.
Goodall Rubber Co., Trenton, N. J.
Holub Industries, Inc., Sycamore, Ill.
Hose Accessories Co., Philadelphia, Pa.
Ideal Corp., Brooklyn, N. Y.
Manufacturers Corp., Mansfield, O.
Marman Div., Aeroquip Corp., Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
Murry Co., Towson, Md.
Nylon Molding Corp., Garwood, N. J.
Polymer Corp., The Reading, Pa.
Punch-Lok Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Richo Plastic Co., Chicago, Ill.
Scovill Mfg. Co., Waterbury, Conn.
Star Tubular Products Co., Chicago, Ill.
Thor Power Tool Co., Aurora, Ill.
Tinnerman Corp., George A., Cleveland, O.
United States Rubber Co., New York, N. Y.
Wittek Manufacturing Co., Chicago, Ill.

CLAMPS, PIPE REPAIR

Adams Pipe Repair Products, So. El Monte, Calif.
Atlas Industries, Inc., Houston, Tex.
Baker & Co., R. H., Los Angeles, Calif.
Band-It Co., Denver, Colo.
Burlis Products Co., Brooklyn, N. Y.
Chelsea Metal Stamping Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Holub Industries, **Inc., Sycamore, Ill.**
Ideal Corp., Brooklyn, N. Y.
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Marman Div., Aeroquip Corp., Los Angeles, Calif.
Morris Coupling & Clamp Co., Kittanning, Pa.
Mueller Co., Decatur, Ill.
Pipe Line Development Co., Cleveland, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Skinner Co., M. B., South Bend, Ind.

Smith-Blair, Inc., South San Francisco, Calif.
Victaulic Co. of America, Elizabeth, N. J.

CLAMPS, PIPE, WELDING

Adjustable Clamp Co., Chicago, Ill.
Aronson Machine Co., Arcade, N. Y.
Atlas Welding Accessories Inc., Ferndale, Mich.
Billings & Spencer Co., Hartford, Conn.
Custanite Corp., Brooklyn, N. Y.
Detroit Stamping Co., Detroit, Mich.
Jewel Mfg. Co., St. Paul, Minn.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Lenco, Inc., Jackson, Mo.
Petersen Mfg. Co., DeWitt, Nebr.
Trindl Products, Ltd., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

CLEANERS, AIR, ELECTRICAL

See Filters, Air, Electrostatic (with outside power source)

CLEANERS, PIPE LINE, ELECTRICALLY DRIVEN

Ken-Way Corp., Sparta, Wis.
Spartan Tool Div., H. D. Conkey & Co., Chicago, Ill.

CLEANERS, TUBE

Airetool Mfg. Co., Springfield, O.
Arcee Products, Pawtucket, R. I. (copper fitting cleaning tool)
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Boiler Equipment Trust, Amherst, Mass.
Chesterton Co., A. W., Everett, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
Elliott Co., Jeannette, Pa.
Hastings Air Control, Inc., Omaha, Nebr.
Mill-Rose Co., Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Osborn Mfg. Co., Cleveland, O.
Pierce Co., Wm. B., The, Buffalo, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Viking Research Corp., Sheboygan, Wis.
Wilson, Inc., Thomas C., Long Island City.

CLEANERS, VACUUM, FOR BOILERS, DUCTS, Etc.

Ace Sycamore, Inc., Sycamore, Ill.
Black & Decker Mfg. Co., The, Towson, Md.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Empire Chemical Products Co., Newark, N. J.
Holub Industries, Inc., Sycamore, Ill.
Ideal Industries, Inc., Sycamore, Ill.
Kent Co., Inc., Rome, N. Y.
Kleen-Air Mfg. Co., Janesville, Wis.
National Super Service Co., The, Toledo, O.
Premier Co., St. Paul, Minn.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.
Truco Masonry Drilling Div., Wheel Trueing Tool Co., Detroit, Mich.

CLEANING COMPOUNDS

See Compounds, Cleaning, Pipe Coil and Condenser

CLEANING COMPOUNDS, AIR FILTER

See Compounds, Cleaning, Air Filter

CLEANING MACHINES, PIPE

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

CLOSURES FOR PROTECTING PIPE AND TUBE FITTINGS

See Plugs, Caps and Closures for Protecting Pipe and Tube Fittings

CLOTH, TREATED, FOR DUST COLLECTORS

American Felt Co., Glenville, Conn.
Bemis Bro. Bag Co., St. Louis, Mo.
Blossom Mfg. Co., Inc., Brooklyn, N. Y.
Canvas Products Co., St. Louis, Mo.
Day Co., The, Minneapolis, Minn.
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Menardi & Co., El Segundo, Calif.
Star Woolen Co., Cohoes, N. Y.
Wheelabrator Corp., Mishawaka, Ind.

CLUTCHES, HYDRAULIC

See Drives, Fluid or Hydraulic, for Power Transmission

COAL BURNERS

See Burners, Pulverized Coal; Stokers

COAL CONVEYORS

See Conveyors, Coal and Ash

COATINGS, PROTECTIVE, FOR METALS

Acme-Fisher Div., Broadway Rubber Corp., Louisville, Ky.
Adhesive Products Corp., New York, N. Y.
Allied Porcenell, Inc., Chicago, Ill. (vitreous enamel coatings)
Amchem Products, Inc., Ambler, Pa. (rust proofing chemicals)
Amercoat Corporation, South Gate, Calif. (epoxy, zinc, vinyl)
American Hard Rubber Co., Div of Amerace Corp., Butler, N. J. (rubber and plastic)
American Solder & Flux Co., Philadelphia, Pa. (Galvanizing powder)
Anderson-Prichard Oil Co., Oklahoma City, Okla.
Angier Adhesives, Div. of Interchemical Corp., Cambridge, Mass.
Arco Co., The, Cleveland, O. (heavy)
Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (asphalt for weather & low temperatures)
Atlas Mineral Products Co., Mertztown, Pa. (plastic)
Automotive Rubber Co., Inc., Detroit, Mich. (rubber)
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Pitchbase and asphalt-base)
Bart Mfg. Corp., Belleville, N. J.
Blue Ridge Talc Co., Inc., Henry, Va.
Borden Co., The, Chemical Div., Coatings & Adhesives Div., Middlesex, N. J.
Brooklyn Paint & Varnish Co., Inc., Brooklyn, N. Y.
Cabot Inc., Samuel, Boston, Mass. (Bituminous black paint)
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carboline Co., The, St. Louis, Mo. (corrosion resisting)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asphalt and aluminum paints for roofs)
Ceilcote, Inc., Cleveland, O. (resin)
Chem Industrial Co., Brooklyn, O. (anti-rust paint)
Chemical Coatings & Engineering Co., Media, Pa.
Chemical Solvent Co., Birmingham, Ala. (liquid)
Chicago Gasket Co., Chicago, Ill.
Chicago Metallizing Co., Chicago, Ill. (for pipe)
Condenser Service & Engineering Co., Inc., Hoboken, N. J. (Metal spray)
Constad Laboratories, Jamaica, N. Y. (anti-rust paint)
Continental Products Co., Euclid, O. (paint)
Cordo Chemical Corp., Norwalk, Conn.
Corite Products, Inc., Chicago, Ill. (plastic)
Coroshield Company, Ltd., New York, N. Y.
Corrosion Control Co., Inc., New York, N. Y.
Corrosite Div., Reliance Paint Co., Brooklyn, N. Y. (vinyl plastic)
Corro-Vent, Inc., Cincinnati, O. (plastic)
Dampney Co., Boston, Mass.
Dearborn Chemical Co., Chicago, Ill. (Rust preventive)
Debevoise Co., The, Brooklyn, N. Y.
Dennis Chemical Co., St. Louis, Mo.
Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y. (polyvinyl "Zip-on" covering)
Dixon Crucible Co., Joseph, Jersey City, N. J.
Dow Corning Corp., Midland, Mich.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Eagle-Picher Co., Cincinnati, O.
Easton R. S. Corp., Brooklyn, N. Y.
Ellicott Fabricators, Inc., Baltimore, Md.
Emjay Maintenance Engineers, Rutherford, N. J.
Ervite Corp., Erie, Pa. (porcelain enamel)
Flexrock Co., Philadelphia, Pa.
Flintkote Co., The, New York, N. Y. (Asphalt emulsions)
Flood Co., Hudson, O. (paint additive)
Foster Co., Benjamin, Philadelphia, Pa. (vinyl)
France Refractories, Co., J. H., Snow Shoe, Pa. (cast iron & steel)
Garlock Packing Co., Palmyra, N. Y. (cementable teflon)
Gates Engineering Co., Wilmington, Del.
Gibson-Homans Co., Cleveland, O.
Glidden Co., The, Cleveland, O. (alkyds; vinyls; epoxys)
Goodall Rubber Co., Trenton, N. J. (liquid Neoprane)
Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Guard Coatings Corp., Long Island City, N. Y.
Hague & Co., Inc., Alfred, Div. of Lacquer & Chemical Corp., Brooklyn, N. Y.
Harco Corp., Cathodic Protection Div., Cleveland, O. (corrosion protection for underground piping, process tanks, storage tanks, and radiant heating piping)
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
Heresite & Chemical Co., Manitowoc, Wis. (Synthetic rubber, pure phenolic coating, baking type)
Hill, Hubbell & Co., Cleveland, O. (coating and wrapping for steel pipe)
Horn Companies, A. C., Subsidiary of Sun Chemical Corp., New York, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Industrial Finishes Co., Inc., Philadelphia, Pa.
Industrial Metal Protectives, Inc., Dayton, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Insul-Coustic, Inc., Maspeth, Long Island, N. Y.
Insul-Mastic Corp. of America, Summit, Ill. (asphaltic & plastic)
Interchemical Corp., Finishes Div., Newark, N. J.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia. (galvanizing compound)
Kendall Co., Polyken Sales Div., Chicago, Ill. (tape, plastic)
Knapp Mills, Inc., Long Island City, N. Y. (lead ferralum)
Knight, Maurice A., Akron, O. (Vinyl plastic base)
Koppers Co., Inc., Pittsburgh, Pa. (coal tar)
Krylon, Inc., Norristown, Pa.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rubber, PVC, neoprene Butyl Hycar)
Lithcote Corp., Melrose Park, Ill. (baked phenolic epoxy vinyl neoprene, plastisol and stone linings)
Maas & Waldstein Co., Newark, N. J.
Markal Co., Chicago, Ill.
Master Mechanics Co., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J. (plastisol-vinyl phenolic)
Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., St. Paul, Minn. (Sound dampening and insulating types as well as for corrosion protection)
Mono-Seal Products, Everett, Mass.
Monroe Co., Inc., Cleveland, O.
Moore & Co., Samuel, Mantau, O. (plastic)
Moran Paint Co., Xenia, O.
Mortell Co., J. W., Kankakee, Ill. (Asphalt)
National Asphalt Corp., Cleveland, O.
National Lead Co., New York, N. Y. (Red lead)
Navan Products Inc., El Segundo, Calif.
Nazar Rubber Co., Toledo, O. (rubber)
Nebel Mfg. Co., Cleveland, O.
Neilson Chemical Co., Detroit, Mich.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Norton Co., Worcester, Mass. (ceramic)
Oakite Products, Inc., New York, N. Y. (phosphate, chromate)

Octagon Process, Inc., Staten Island, N. Y. (rust preventive oils, rust-proofing compounds)
Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y. (Acid resistant, heat resistant)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa. (cement)
Penn Galvanizing Co., Philadelphia, Pa. (Galvanizing)
Pennsalt Chemicals Corp., Philadelphia, Pa. (chlorinated hydrocarbon base, and liquid neoprene base)
Permacel, New Brunswick, N. J.
Peters Co., The, Div. of Toledo Paint & Chemical Co., Toledo, O.
Pipeline Coatings & Engineering Co., Los Angeles, Calif.
Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Paint, varnish, lacquer)
Plicoflex, Inc., Los Angeles, Calif. (plastic)
Poe Co., C. W., The, Cleveland, O.
Polymer Corp., The, Reading, Pa. (plastic fusion bond finishes)
Porce-Lin Tank Lining Co., Detroit, Mich.
Presstite Div., American-Marietta Co., St. Louis.
Pyrolite Products Co., Cleveland, O.
Quelcor, Inc., Chester, Pa. (plastic)
Quigley Co., Inc., New York, N. Y.
Ransburg Electro-Coating Corp., Indianapolis, Ind. (electrostatic air spray coating)
Reilly Tar & Chemical Corp., Indianapolis, Ind. (Coal tar base)
Rhopac, Inc., Skokie, Ill. (pipe insulation)
Robertson Co., H. H., Pittsburgh, Pa. (polyester resin)
Rotometals, San Francisco, Calif. (galvanizing repair stick)
Rubber & Plastics Compound Co., New York, N. Y. (anticorrosive coating)
Rusticide Products Co., Cleveland, O.
Rust-Oleum Corp., Evanston, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Saverite Engineering Co., Hoboken, N. J. (Tank coatings, rust preventive)
Sealed Unit Parts Co., Inc., New York, N. Y. (liquid)
Sheldon & Co., Inc., M. L., New York, N. Y.
Sherwin-Williams Co., The, Cleveland, O.
Shutt Process Equipment Corp., St. Louis.
Solar Aircraft Co., San Diego, Calif. (ceramic)
Solfo Paint Mfg. Co., Trenton, N. J.
Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga. (Metallic paint)
Special Chemicals Corp., Ossining, N. Y. (Aluminum paint)
Speco, Inc., Cleveland, O.
Standard Oil Co. of California, San Francisco, Calif.
Starline Co., Dayton, O.
Steelcote Mfg. Co., St. Louis, Mo.
Surface Chemicals, Inc., McKees Rocks, Pa. (plastic)
Tapecoat Co., The, Evanston, Ill. (coal tar protective coating in tape form, for pipe, and pipe joints, pipe fittings, insulated pipe, both underground and above ground)
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O. (priming paint for iron & zinc)
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich. (alkyd and epoxy resin)
Turco Products, Inc., Los Angeles, Calif.
United States Gasket Co., Camden, N. J. (fluorocarbon plastics)
United States Rubber Co., New York, N. Y. (rubber plastic, liquid plastic)
United States Stoneware Co., New York, N. Y. (Corrosion resistant)
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (vinyls)
Vimasco Corp., Nitro, W. Va. (vinyl)
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Norwood, Mass.
Wilhelm Co., A., Reading, Pa.
Wolfe-Kote Co., Inc., Sheboygan, Wis.
X-Pando Corp., Long Island City, N. Y. (epoxy)

COCKS, BOILER GAGE

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., Florham Park, N. J.
Swift Lubricator Co., The, Elmira, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

COILS, CONDENSATION

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Buxton Mfg. Co., Dover, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
General Ceramics Corp., Keasbey, N. J. (ceramic and plastic)
General Fittings Co., East Greenwich, R. I.
Heatron, Inc., York, Pa.
Lewis & Saunders, Inc., Lakeport, N. H.
Old Dominion Iron & Steel Corp., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Star Tubular Products Co., Chicago, Ill.
Superior Radiator Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Young Radiator Co., Racine, Wis.
Yula Corp., Bronx, N. Y.

COILS, COOLING

See Surface, Finned, Cooling

COILS, DIRECT EXPANSION

See Surface, Finned, Cooling

COILS, FINNED

See Surface, Finned, Cooling; Surface, Finned, Heating

COILS, HEATING

See Surface, Finned, Heating

COILS, FOR HOT WATER STORAGE TANKS

Adams Co., The, Dubuque, Ia.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alstrom Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American Tube Products, Inc., West Warwick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Bernstrom, Inc., C. R., Providence, R. I.
Bros Inc., Minneapolis, Minn.
Buxton Mfg. Co., Dover, N. J.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dormont Mfg. Co., Pittsburgh, Pa.
Ellicott Fabricators, Inc., Baltimore, Md.
Federal Boiler Co., Inc., Midland Park, N. J.
General Fittings Co., East Greenwich, R. I.
Killebrew Engineering Corp., St. Louis, Mo.
Lewis & Saunders, Inc., Lakeport, N. H.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Mar-Coil Heater Co., Union, N. J.
National Pipe Bending Co., New Haven, Conn.
Old Dominion Iron & Steel Corp., Richmond, Va.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Queen City Engineering Co., Charlotte, N. C
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sims Co., Erie, Pa.
Star Tubular Products Co., Chicago, Ill.
Taco Heaters, Inc., Cranston, R. I.
Tranter Mfg., Inc., Lansing, Mich.
Water Tube Boiler & Tank Co., Chicago, Ill.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Corp., Bronx, N. Y.

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

Also see Ceilings, Radiant Heating and Cooling, and Acoustical Control

American Brass Co., Waterbury, Conn.
Atlantic Pipe Bending and Fabricating Corp., Moonachie, N. J.
Burgess-Manning Co., Architectural Products Div., Libertyville, Ill. (also for radiant cooling)
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Fricke, Fred J., Albuquerque, N. M.
Heat & Power Corp., Baltimore, Md.
Knapp Mills, Inc., Long Island City, N. Y. (lead clad)
Kritzer Radiant Coils, Inc., Batavia, Ill.
Nesbitt, Inc., John J., Philadelphia, Pa.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (roll bonded metal panels incorporating fluid passages)
Panel Heat, Inc., Copiague, N. Y.
Price Brothers, Dayton, O. (concrete slabs with openings for air travel or for hot water coils)
Radiant Heat and Cooling Co., Santa Clara, Calif.
Radiant Panel Mfg. Co., Torrington, Conn.
Reflectotherm, Inc., Cincinnati, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Simplex Ceiling Corp., New York, N. Y.
Taylor Engineering Corp., Detroit, Mich.
Tranter Mfg. Inc., Lansing, Mich.
Wallace Supplies Mfg. Co., Chicago, Ill.

COILS, PIPE

Albert Pipe & Supply Co., Inc., Brooklyn, N. Y.
American Cooling Towers Co., Kansas City, Mo.
American Smelting & Refining Co., Federated Metals Div., New York, N. Y. (lead, lead covered and lead alloy)
Atlantic Pipe Bending and Fabricating Corp., Moonachie, N. J.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Chicago Nipple Mfg. Co., Oak Park, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Crane Co., Chicago, Ill.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Harris & Co., Arthur, Chicago, Ill.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
Heil Process Equipment Corp., Cleveland, O. (Impervious Graphite)
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
Kopperman & Sons, Inc., Joseph, Philadelphia, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewis & Saunders, Inc., Lakeport, N. H.

Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
National Pipe Bending Co., New Haven, Conn.
Niagara Blower Co., New York, N. Y.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Old Dominion Iron & Steel Corp., Richmond, Va.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Shaw-Kendall Engineering Co., Toledo, O.
Star Tubular Products Co., Chicago, Ill.
Swan Engineering Co., Bloomfield, N. J.
Taylor Engineering Corp., Detroit, Mich.
Tranter Mfg., Inc., Lansing, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wallace Supplies Mfg. Co., Chicago, Ill.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

COLLECTION, DUST AND FUME, ULTRASONIC

Narda Ultrasonics Corp., Westbury, Long Island, N. Y.

COLLECTORS, DUST

Aerotec Corp., The, Greenwich, Conn. (mechanical and electrical)
Aget Mfg. Co., Adrian, Mich. (cyclone; cloth-filter types)
Allington & Curtis Mfg. Co., Saginaw, Mich. (centrifugal & bag)
American Air Filter Co., Inc., Louisville, Ky.
American Blow Pipe Co., Chicago, Ill. (shavings and sawdust, wet and dry type, buffing and polishing)
American-Standard Industrial Div., Detroit, Mich.
Baker Co., Inc., The, Biddeford, Me. (portable)
Banister Co., Inc., Cambridge, Mass. (centrifugal-dry and wet)
B-I-F Industries, Omega Div., Providence, R. I. (bag type)
Blower Application Co., Milwaukee, Wis. (cyclone)
Bubar Dust Systems, Old Lyme, Conn. (mechanical)
Buell Engineering Co., Inc., New York, N. Y. (cyclonic, electrostatic)
Buffalo Forge Co., Buffalo, N. Y. (wet & dry)
Carolina Blower Co., Inc., Greensboro, N. C. (cyclone)
Centri-Spray Corp., Livonia, Mich. (Wet type)
Cincinnati Electrical Tool Co., The, Cincinnati, O. (self contained)
Cincinnati Fan & Ventilating Co., Cincinnati.
David-Ludwig Co., Detroit, Mich.
Day Co., The, Minneapolis, Minn. (cyclones & filters)
DeVilbiss Co., The, Toledo, O.
DeVilbiss Metal Fabricators Co., Detroit, Mich.
Ducon Co., Inc., The, Mineola, N. Y. (Cyclone, centrifugal wash, and bag type)
Dust Filter Co., Chicago, Ill. (wet)
Dust Suppression & Engineering Co., Lake Orion, Mich.
Dustender Co., Ann Arbor, Mich.
Dustex Corp., Buffalo, N. Y. (mechanical)
Empire Chemical Products Co., Newark, N. J.
Farr Co., Los Angeles, Calif. (cyclonic)
Fluor Products Co., Santa Rosa, Calif. (cyclone — wet & dry types)
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Green Fuel Economizer Co., Inc., The, Beacon, N. Y (dry type)
Griffin & Co., Inc., Louisville, Ky. (cyclone)
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Johnson March Corp., Philadelphia, Pa.
Joy Mfg. Co., Pittsburgh, Pa. (wet impingement)
Kice Metal Products Co., Wichita, Kans. (cyclone type)
Kirk & Blum Mfg. Co., Cincinnati, O. (cyclone)
Koppers Co., Inc., Pittsburgh, Pa. (mechanical)
Koppers Company, Inc., Metal Products Div., Baltimore, Md. (electrostatic)
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich. (dry inertia, air washers, fog filters)
Majac, Inc., Pittsburgh, Pa. (power driven)
National Dust Collector Corp., Chicago, Ill. (wet type)
Newcomb-Detroit Co., Detroit, Mich. (recirculating spray tube)
Northern Blower Co., Cleveland, O.
Pangborn Corp., Hagerstown, Md. (cloth filter and wet type)
Peabody Engineering Corp., New York, N. Y. (wet)
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Summit, N. J. (filter bag)
Research-Cottrell, Inc., Bound Brook, N. J. (electrostatic & mechanical)
Ruemelin Mfg. Co., Milwaukee, Wis. (cloth bag type)
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Inc., Detroit, Mich. (wet type)
Schneible Co., Claude B., Detroit, Mich. (wet type)
Shutt Process Equipment Co., St. Louis, Mo.
Sly Mfg. Co., W. W., Cleveland, O. (cloth bag type)
Spencer Turbine Co., Hartford, Conn.
Sprout-Waldron & Co., Inc., Muncy, Pa.
Torit Mfg. Co., St. Paul, Minn. (cloth filter and centrifugal separator)
United Sheet Metal Co., Inc., Columbus, O. (cyclone)
Universal Gear & Machine Co., Detroit, Mich. (for portable industrial applications)
Vacu-Blast Co., Inc., Belmont, Calif. (wet type)
Wagner Awning & Mfg. Co., Cleveland, O. (Dust recovery bags)
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles, Calif.
Wheelabrator Corp., Mishawaka, Ind. (cloth-tube and wet types)
Winkler & Sons, Inc., A. E., Milwaukee, Wis. (cyclone)
Young & Bertke Co., Cincinnati, O. (cyclone type)
Zack Co., The, Chicago, Ill.

COLLECTORS, MIST

Aget Mfg. Co., Adrian, Mich.
Cincinnati Electrical Tool Co., Cincinnati, O.
National Dust Collector Corp., Chicago, Ill. (wet type)
Research-Cottrell, Inc., Bound Brook, N. Y.
Torit Mfg. Co., St. Paul, Minn.

COLORIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Bausch & Lomb Optical Co., Rochester, N. Y.
Ellison Draft Gage Co., Chicago, Ill.
EPIC, Inc., New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
Will Corp., Rochester, N. Y.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMBUSTION CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion; Systems, Combustion Control

COMBUSTION RECORDERS

See Recorders, Carbon Dioxide

COMBUSTION TESTING KITS

See Kits, Combustion Testing; Analyzers, Carbon Dioxide, Portable; Indicators, Smoke; Testers, Smoke

COMPOUNDS, AIR FRESHENING

Acme Chemical Co., Milwaukee, Wis.
Aireactor Corp., New York, N. Y.
Airkem, Inc., New York, N. Y.
Ampion Corp., Long Island City, N. Y.
Barnebey-Cheney Co., Columbus, O.
Easton R. S. Corp., Brooklyn, N. Y.
Lord & Clark Co., Inc., Boston, Mass.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.

COMPOUNDS, ANTI-FREEZE, FOR SNOW MELTING COILS

Commercial Solvents Corp., New York, N. Y.
Dow Chemical Co., The, Midland, Mich.
Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.

COMPOUNDS, BOILER CLEANING

Agnew & Tomlinson, Long Island City, N. Y.
American K. A. T. Corp., Subsidiary of Magnus Chemical Co., Inc., Garwood, N. J.
American Sand-Banum Co., Inc., Merrick, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
Drew & Co., Inc., E. F., New York, N. Y.
duPont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Easton R. S. Corp., Brooklyn, N. Y.
Empire Chemical Products Co., Newark, N. J.
Gotham Refining Chemical Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Kenite Laboratory, Madison, N. J.
Kewanee-Ross Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lester Laboratories, Inc., Atlanta, Ga.
Lindy Heaters, Inc., New York, N. Y.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Morheat Corp., Cincinnati, O.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Perolin Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Sealed Unit Parts Co., Inc., New York, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Squires Co., C. E., The, Cleveland, O.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.

Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Warren Refining & Chemical Co., The, Cleveland, O.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, BOILER AND RADIATOR SEALING

Ampion Corp., Long Island City, N. Y.
Arco Co., The, Cleveland, O.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Eagle-Picher Co., Cincinnati, O.
Hampton-Cross Co., The, Louisville, Ky.
Hercules Chemical Co., Inc., New York.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Madison, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Refractory & Insulation Corp., New York N. Y.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Whitlam Mfg. Co., J. C., Wadsworth, O.
X Laboratories, Inc., New York, N. Y.
X Pando Corp., Long Island City, N. Y.

COMPOUNDS, CAULKING AND SEALING

Acorn Refining Co., Cleveland, O.
Arco Co., The, Cleveland, O.
Babbitt Chemical Co., New Bedford, Mass.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Cordo Chemical Corp., Norwalk, Conn.
Corrosion Control Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Gates Engineering Co., Wilmington, Del.
Johns-Manville, New York, N. Y.
Lastik Paint, Inc., Pittsburgh, Pa.
Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
Mortell Co., J. W., Kankakee, Ill.
Nebel Mfg. Co., Cleveland, O.
Pecora Inc., Philadelphia, Pa.
Plastic Products Co., Detroit, Mich.
Products Research Co., Los Angeles, Calif.
Smooth-On Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Thiokol Chemical Corp., Trenton, N. J.
Whitlam Mfg. Co., J. C., Wadsworth, O.
X-Pando Corp., Long Island City, N. J.

COMPOUNDS, CLEANING, AIR FILTER

Airkem, Inc., New York, N. Y.
Dollinger Corp., Rochester, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Lester Laboratories, Inc., Atlanta, Ga.
Magnus Chemical Co., Garwood, N. J.
Montgomery Chemical Co., Jenkintown, Pa.
National Aniline Div., Allied Chemical Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Perolin Co., Inc., The, New York, N. Y.
Peters Co., The, Div. of Toledo Paint & Chemical Co., Toledo, O.
Smith Chemical Co., E. W., La Puente, Calif.
Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Trion, Inc., McKees Rocks, Pa.
Turco Products, Inc., Los Angeles, Calif.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.

COMPOUNDS, CLEANING, PIPE COIL AND CONDENSER

Acme Chemical Co., Milwaukee, Wis.
Airkem, Inc., New York, N. Y.
Amchem Products, Inc., Ambler, Pa.
American Sand-Banum Co., Inc., Merrick, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carolina Aniline & Extract Co., Inc., Charlotte, N. C.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
du Pont de Nemours & Co., Inc., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Garman Co., Inc., The, St. Louis, Mo. (also for pumps, condensers, etc.)
Gotham Refining Chemical Co., New York, N. Y.
Hercules Chemicals Co., Inc., New York, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Krylon, Inc., Norristown, Pa.
Lester Laboratories, Inc., Atlanta, Ga.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Perolin Co., Inc., New York, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Turco Products, Inc., Los Angeles, Calif.
Water Treatment Co. of America, Pittsburgh, Pa.

COMPOUNDS, CLEANING, TANK

Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
Easton R. S. Corp., Brooklyn, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Lester Laboratories, Inc., Atlanta, Ga.
Magnus Chemical Co., Garwood, N. J.
National Aniline Div., Allied Chemicals Corp., New York, N. Y.
Neilson Chemical Co., Detroit (Ferndale), Mich.
Oakite Products, Inc., New York, N. Y.
Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Perolin Co., Inc., The, New York, N. Y.
Peters Co., The, Div. of Toledo Paint & Chemical Co., Toledo, O.
Radiator Specialty Co., Charlotte, N. C.
Sellers Injector Corp., Philadelphia, Pa. (water driven)
Smith Chemical Co., E. W., La Puente, Calif.
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Sudbury Laboratory, South Sudbury, Mass.

COMPOUNDS, LEAK DETECTING

See Isotopes, Radioactive, for Detecting Leaks in Piping and Heating Systems

COMPOUNDS, WELDING

Allen Co., Inc., L. B., Schiller Park, Ill.
Allied Weld-Craft, Inc., Indianapolis, Ind.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Solder & Flux Co., Philadelphia, Pa.
Atlas Welding Accessories Inc., Ferndale, Mich.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., Rahway, N. J.
Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Modern Engineering Co., St. Louis, Mo.
Presstite Div., American-Marietta Co., St. Louis, Mo.
Sight Feed Generator Co., West Alexandria, O.
Solar Aircraft Co., San Diego, Calif.
Special Chemicals Corp., Ossining, N. Y.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Thompson and Co., Oakmont, Pa.
Turco Products, Inc., Los Angeles, Calif.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COMPRESSED AIR DEHUMIDIFIERS

See Dehumidifiers for Compressed Air

COMPRESSED AIR MOTORS

See Motors, Compressed Air Powered

COMPRESSION PIPE FITTINGS

See Fittings, Pipe, Compression

COMPRESSOR BASES

See Bases, Vibration Isolating Pad Type; Bases, Vibration Isolating, Spring Type

COMPRESSOR PARTS

See Parts, Air Compressors; Parts, Refrigerating Compressors

COMPRESSOR SEALS

See Seals, Terminal, for Compressors

COMPRESSORS, AIR

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Atlas Copco Eastern, Inc., Paramus, N. J.
Beach-Russ Co., New York, N. Y.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., Baltimore, Md.
Brunner Div. of Dunham-Bush, Inc., West Hartford, Conn.
Bury Compressor Co., Erie, Pa.
Carrier Corp., Syracuse, N. Y.
Champion Pneumatic Machinery Co., Princeton, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Chicago Pump Co., Subsid. of Food Machinery & Chemical Corp., Chicago, Ill.
Clark-Cooper Co., C C Pump Div., Palmyra, N. J.
Cooper-Bessemer Corp., Mt. Vernon, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis
Davey Compressor Co., Kent, O.
Dayton Electric Mfg. Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Dunham-Bush, Inc., West Hartford, Conn.
Essick Mfg. Co., Los Angeles, Calif.
Fuller Co., Catasauqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gray Co., Inc., Minneapolis, Minn.
Haskel Engineering & Supply Co., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Joy Mfg. Co., Pittsburgh, Pa.
Lammert & Mann Co., Chicago, Ill.
Lapp Insulator Co., LeRoy, N. Y. (for hard to handle gases with leak-proof diaphragm)
LeRoi Div., Westinghouse Air Brake Co., Milwaukee, Wis.
M & E Mfg. Co., Indianapolis, Ind.
Multiplex Mfg. Co., Berwick, Pa.
Nash Engineering Co., South Norwalk, Conn.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powers Regulator Co., Skokie, Ill.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Schramm, Inc., West Chester, Pa.
Solar Aircraft Co., San Diego, Calif.
Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wayne Pump Co., Div. of Symington Wayne Corp., Ft. Wayne, Ind.
Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Wilson Co., K. R., Arcade, N. Y.
Winslow Mfg. Corp., Hialeah, Fla. (portable)
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.
York Corp., Subsid. of Borg-Warner Corp., York, Pa. (centrifugal)

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

American-Standard Industrial Div., Detroit, Mich.

Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (open and hermetic)
Trane Co., The, LaCrosse, Wis.
Worthington Corp., East Orange, N. J. (open & hermetic)
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

Acme Industries, Inc., Jackson, Mich.
Bell & Gossett Co., Morton Grove, Ill.
Brown Products Corp., Union, N. J.
Brunner Div. of Dunham-Bush, Inc., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (open and hermetic)
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dialatemp, Inc., St. Louis, Mo.
Dunham-Bush, Inc., West Hartford, Conn.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
General Machine & Mfg. Co., Berwick, Pa.
Governair Corp., Oklahoma City, Okla.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Hydromation Corp., Chicago, Ill.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Lehigh Mfg. Co., Div. of Lehigh, Inc., Easton, Pa.
Mayer Refrigerating Eng., Inc., Lincoln Park, N. J.
National-U. S. Radiator Corp., Johnstown, Pa.
Schnacke, Inc., Evansville, Ind.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
United States Air Conditioning Corp., Delaware, O. (5 to 150 tons)
Vilter Mfg. Co., The, Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

COMPRESSORS, REFRIGERATING, RECIPROCATING

Bendix-Westinghouse Automotive Air Brake Co., Evansville, Ind. (hermetic)
Brunner Div. of Dunham-Bush, Inc., West Hartford, Conn. ("Freon" 12 & 22) (open & hermetic)
Carrier Corp., Syracuse, N. Y. (open & hermetic)
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (open and hermetic)
Cooper-Bessemer Corp., The, Mt. Vernon, O. (open)
Copeland Refrigeration Corp., Sidney, O. (open & hermetic)
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo. (open)
Dersch, Gesswein & Neuert, Inc., Chicago, Ill. (open)
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa. (Ammonia, "Freon") (open)
General Machine & Mfg. Co., Berwick, Pa. (open & hermetic)
Howe Ice Machine Co., Chicago, Ill. (open)
Ingersoll-Rand Co., New York, N. Y. (open)
Kelvinator Div., American Motors Corp., Detroit, Mich. (hermetic)
Kramer Trenton Co., Trenton, N. J.
Lehigh Mfg. Co., Div. of Lehigh Inc., Easton, Pa. (open & hermetic)
Multiplex Mfg. Co., Berwick, Pa. (open)
Onan & Sons Inc., D. W., Minneapolis, Minn. (engine-driven)
Ready-Power Co., The, Detroit, Mich. (refrigeration unit driven by direct-connected internal combustion engine) (hermetic)
Reliance Refrigerating Machine Co., Chicago, Ill. ("Freon," methyl chloride, ammonia) (open)
Schnacke, Inc., **Evansville, Ind.**
Stewart Ice Machine Co., Pomona, Calif. (open)
Tecumseh Products Co., Tecumseh, Mich. (open and hermetic)
Thermo King Corp., Minneapolis, Minn. (open)
Trane Co., The, LaCrosse, Wis. (hermetic)
Vilter Mfg. Co., Milwaukee, Wis. ("Freon" ammonia) (open)
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va. (hermetic)
Worthington Corp., East Orange, N. J. (open and hermetic)
York Corp., Subsidiary of Borg-Warner Corp., York, Pa. (Ammonia, freon) (open and hermetic)

COMPRESSORS, REFRIGERATING, STEAM JET

Croll-Reynolds Engrg. Co., Inc., New York, N. Y.
Elliott Co., Jeannette, Pa.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.

COMPRESSORS, STEAM BOOSTER

Bury Compressor Co., Erie, Pa.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Worthington Corp., East Orange, N. J.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING

Mearlcrete Div., Mearl Mfg. Corp., Roselle Park, N. J.
Poe Co., C. W., The, Cleveland, O.
Zonolite Co., Chicago, Ill.

CONDENSATE DISPOSAL UNITS

See Pumps, Condensate, For Removing Condensation From Air Conditioning Units

CONDENSATE RETURN

See Pumps, Condensation Return; Systems, Condensate Return

CONDENSATION METERS

See Meters, Condensation

CONDENSATION PUMPS

See Pumps, Condensation

CONDENSER TUBES

See Tubes, Condenser

CONDENSERS, REFRIGERATING, AIR COOLED

Acme Industries, Inc., Jackson, Mich. (3-100 tons)
American Coils Co., Farmingdale, N. J. (2 to 5 tons)
American Furnace Co., St. Louis, Mo. (to 10 tons)
American-Standard Air Conditioning Div., New York, N. Y. (2, 3, 4, & 5 hp size)
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O. (2, 3 & 5 ton)
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Blazer & Son, M., Passaic, N. J. (to 300 tons)
Bohn Aluminum & Brass Corp., Detroit, Mich. (2, 3, 5, & 7 ton)
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill. (2-15 tons)
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., **Dayton, O.**
Cobell Industries, Inc., Cleburne, Tex., (2 to 5 ton)
Cond-Air Div., Elliott Engineering Co., Lynwood, Calif.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Day & Night Mfg. Co., La Puente, Calif. (3, 4, 5, 7½ tons)
Deansteel Products Co., San Antonio, Tex. (3, 5, 7½ ton)
Domestic Mfg. Corp., Houston, Tex.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J. (2 to 1000 tons)
F 5 Air Conditioning Corp., Tulsa, Okla. (2-80 tons)
Fedders Corp., Buffalo, N. Y.
Fraser & Johnston Co., San Francisco, Calif.
Friedrick Refrigerators, Inc., San Antonio, Tex. (5 to 10 hp)
Frigid Coil, Inc., El Monte, Calif.
General Air Conditioning Corp., Los Angeles, Calif. (2, 3 ton)
General Electric Co., Air Conditioning Dept., Tyler, Tex. (7½ & 10 tons)
Halstead & Mitchell, Pittsburgh, Pa. (3 to 100 tons)
Heat-Exchangers, Inc., Chicago, Ill. (up to 10 ton)
Henry Furnace Co., The, Medina, O. (2, 3, 4, 5 ton)
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga. (2 to 40 tons)
Lennox Industries, Inc., **Marshalltown, Ia. (2, 3, 5, 7½ and 10 ton)**
Magic Aire Div., United Electric Co., Wichita Falls, Tex., (2, 3, 5, 7½ & 10 tons)
Marley Co., The, Kansas City, Mo. (15 to 100 tons)
Marlo Coil Co., St. Louis, Mo. (1 to 50 tons)
McCord Corp., Detroit, Mich. (to 3 HP)
McQuay, Inc., Minneapolis, Minn. (7 to 75 tons)
Mueller Climatrol Div. of Worthington Corp., Milwaukee, Wis.
Payne Co., LaPuente, Calif. (2, 3, 4, 5, 7½ hp)
Peerless of America, Inc., Chicago, Ill.
Perfection Industries Div., Hupp Corp., Cleveland, O. (2 thru 20 tons)
Recold Corp., **Los Angeles, Calif.** (5 thru 40 tons)
Refrigeration Appliances, Inc., Chicago, Ill. (1-60 tons)
Rempe Co., **Chicago, Ill.**
Rittling Corp., The, Buffalo, N. Y. (up to 7½ hp)
Roberts-Gordon Appliance Corp., Buffalo, N. Y. (2-5 tons)
Rome-Turney Radiator Co., Rome, N. Y.
Round Oak Co., Inc., Dowagiac, Mich. (1½-5 HP)
Silvercraft, Inc., **Louisville, Ky.**
Superior Radiator Corp., Minneapolis, Minn. (½ thru 30 HP)
Temtrol, Inc., Okarche, Okla.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Thermo King Corp., Minneapolis, Minn.
Trane Co., The, **La Crosse, Wis.** (2 to 30 tons)
Tubenfin Coil Co., Houston, Tex. (remote; up to 60 tons)
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Delaware, O. (3, 5, 7½ & 10 hp)
Vilter Mfg. Co., The, Milwaukee, Wis.
Weatherbuster Corp., Camden, Ark. (5 to 15 tons)
Westinghouse Electric Corp., Air Conditioning Div., **Staunton, Va.**
Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O. (2, 3 & 5 tons)
Witt Co., A. H., Los Angeles, Calif. (2-50 tons)
Worthington Corp., **East Orange, N. J.**

CONDENSERS, REFRIGERATING, EVAPORATIVE

Acme Industries, Inc., Jackson, Mich.
American Cooling Tower Co., Kansas City, Mo.
American-Standard Industrial Div., Detroit, Mich.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Blazer & Son, M., Passaic, N. J. (to 300 tons)
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y. ("Freon," ammonia)
Chrysler Airtemp Div. of Chrysler Corp.,

Dayton, O. (5 to 30 tons)
Cobell Industries, Inc., Cleburne, Tex. (2 to 10 tons)
Cond-Air Div., Elliott Engineering Co., Lynwood, Calif.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Governair Corp., Oklahoma City, Okla.
Imeco, Inc., Chicago, Ill.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Recold Corp., Los Angeles, Calif. (2 thru 230 tons)
Refrigeration Appliances, Inc., Chicago, Ill.
Temtrol, Inc., Okarche, Okla.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Wall Tube and Metal Products Co., Newport, Tenn.
Watkins Co., J. E., Maywood, Ill.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., East Orange, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

CONDENSERS, REFRIGERATING, SHELL AND COIL

Acme Industries, Inc., Jackson, Mich.
American Coils Co., Farmingdale, N. J. (3-10 tons)
Bell & Gossett Co., Morton Grove, Ill.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
General Fittings Co., East Greenwich, R. I.
Halstead & Mitchell, Pittsburgh, Pa. (Double tube)
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Howe Ice Machine Co., Chicago, Ill. (Freon ammonia methyl chloride)
Lehigh Mfg. Co., Div. of Lehigh Inc., Easton, Pa.
National-U. S. Radiator Corp., Johnstown, Pa.
Nooter Corp., St. Louis, Mo.
Reco Products Div., Recony Corp., New York, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Water Tube Boiler & Tank Co., Chicago, Ill.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Corp., W. Hartford, Conn.
Worthington Corp., East Orange, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

CONDENSERS, REFRIGERATING, SHELL AND TUBE

Acme Industries, Inc., Jackson, Mich.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y
American-Standard Industrial Div., Detroit, Mich.
Armstrong Co., Richard M., West Chester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E. Akron, O.
Buxton Mfg. Co., Dover, N. J.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., Johnstown, Pa.
Nooter Corp., St. Louis, Mo.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Ready-Power Co., The, Detroit, Mich.
Reco Products Div., Recony Corp., New York.
Reliance Refrigerating Machine Co., Chicago, Ill.
Schnacke, Inc., Evansville, Ind.
Standard Refrigeration Co., Chicago, Ill.
Stewart Ice Machine Co., Pomona, Calif.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Water Tube Boiler & Tank Co., Chicago, Ill.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., W. Hartford, Conn.
Worthington Corp., East Orange, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Corp., Bronx, N. Y.

CONDENSERS, WATER DISTRIBUTORS FOR

See Distributors, Water, for Condensers

CONDENSING UNITS

See Compressors

CONDITIONERS, WATER

American Water Softener Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Cochrane Corp., Philadelphia, Pa.
Elgin Softener Corp., Elgin, Ill.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stiles Karlsonite Corp., Waukegan, Ill.
Water Service Laboratories, Inc., New York, N. Y.

CONDUIT, UNDERGROUND PIPING

Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Durant Insulated Pipe Co., E. Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Cleveland, O.
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC)
Heat Transmission Conduit Co., Cleveland, O.
Johns-Manville, New York, N. Y. (asbestos-cement)
Kaiser Co., E. B., Glenview, Ill.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Mearlcrete Div., Mearl Mfg. Corp., Roselle Park, N. J.
Porter & Co., Inc., H. W., Newark, N. J.
Ric-wiL, Inc., Barberton, O.
Tubular Div., The National Supply Co., Pittsburgh, Pa.
U-Con Co., Annapolis, Md.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

Anaconda Metal Hose Div., American Brass Co., Waterbury, Conn.
Cain Mfg. Inc., Birmingham, Ala.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keldur Div. of Quimby & Co., Chester, N. J.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rubber)
Nicolet Industries, Inc., Hamilton, O.
St. Clair Rubber Co., Detroit, Mich.
Titeflex, Inc., East Springfield, Mass.
United States Rubber Co., New York, N. Y.
Ventfabrics Inc., Chicago, Ill.
Wagner Awning & Mfg. Co., Cleveland, O.

CONNECTORS, FILLING, HYDROSTATIC TEST

Airaterra (Roylyn Products), Glendale, Calif.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Gasoilair Equipment, New Haven, Conn.
Mechanical Products Corp., Chicago, Ill.
Scully Signal Co., Melrose, Mass.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

CONNECTORS, FOR NON-METALLIC DUCT FABRICATION

Acme Steel Co., Chicago, Ill. (Strapping)
Cain Mfg. Inc., Birmingham, Ala.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (unplasticized polyvinyl chloride)
Lumm Co., A. H., Toledo, O.
United States Rubber Co., New York, N. Y.

CONTINUOUS HEATERS

See Heaters, Steam Jet, for Liquids

CONTROL, SAFETY, GAS FLOW

Dewey Gas Furnace Co., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
General Controls Co., Glendale, Calif.
Hastings-Raydist, Inc., Hampton, Va.

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING AND VENTILATING

Factory Assemblies Using Other Manufacturers' Valves, Thermostats, Damper Motors, etc.

American Moistening Co., Cleveland, N. C.
Arens Controls, The, Evanston, Ill.
Automatic Control Co., St. Paul, Minn.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Better Engineered Controls, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Carvell Heat Equipment Co., Los Angeles, Calif.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cleveland Controls, Inc., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Devco Engineering, Inc., Control Systems Div., Caldwell, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
Heat-Timer Corp., New York. N Y.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
International Business Machines Corp., New York, N. Y.
Master Control Co., The, Cuyahoga Falls, O.
Midwest Air Conditioning Co., Des Moines, Ia.
Midwest Automatic Control Co., Des Moines, Ia.

National Controls, Inc., Newton, Mass.
Protection Controls, Inc., Skokie, Ill.
Ray Oil Burner Co., San Francisco, Calif.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
West Instrument Corp., Chicago, Ill.

CONTROL SYSTEM TUBING

See Tubing, Control, for Instrumentation

CONTROLLERS AND STARTERS, MOTOR

ACEC Electric Corp., New York, N. Y.
Airgard Mfg. Co., Chicago, Ill.
Allen-Bradley Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elec. Co., Hartford, Conn.
Better Engineered Controls, Los Angeles, Calif.
Clark Controller Co., Cleveland, O.
Curtis Development & Mfg. Co., Milwaukee, Wis.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Ebert Electronics Corp., Queens Village, **N. Y.**
Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
Electric Machinery Mfg. Co., Minneapolis, **Minn.**
Electric Products Co., Cleveland, O.
Franklin Dales Co., Akron, O.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., **Schenectady, N. Y.**
General Electric Co., Appliance Control Dept., Morrison, Ill.
Guardian Electric Mfg. Co., Chicago, Ill.
Ideal Electric & Mfg. Co., Mansfield, O.
International Business Machine Corp., New York, N. Y.
Magnetrol, Inc., Chicago, Ill.
Mechanical Products, Inc., Jackson, Mich.
Minneapolis-Honeywell Regulator Co., Minne**apolis, Minn.**
Monitor Controller, Rockland, Mass.
Nelson Electric Mfg. Co., Tulsa, Okla.
Potter & Brumfield, Princeton, Ind.
Reynolds Electric Co., River Grove, Ill.
Square D Co., Industrial Controller Div., **Milwaukee, Wis.**
Teleflex Industrial Products, Inc., Boyertown, Pa.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Zenith Electric Co., Chicago, Ill.

CONTROLS, AIR CONDITIONING

See Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Thermostats; Valves, Diaphragm; Valves, Refrigeration; Valves, Solenoid

CONTROLS, DOOR, ELECTRIC EYE (FOR AIR CONDITIONED ROOMS)

Barber-Colman Co., Rockford, Ill.
Clark Controller Co., Cleveland, O.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
De-Tec-Tronic Corp., Chicago, Ill.
Photobell Co., Inc., New York, N. Y.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn. (automatic)
Westinghouse Electric Corp., Pittsburgh, Pa.
Worner Electronics Devices, Rankin, Ill.

CONTROLS, DRAFT, BAROMETRIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Boston Machine Works Co., Lynn, Mass.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif.
Hotstream Heater Co., Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Photomation, Inc., Bergenfield, N. J.
Plant Equipment Div., General Blower Co., Inc., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Salina Metal Products Co., Salina, Kan.
Simplex Mfg. Co., Fond du Lac, Wis.
Steinen Mfg. Co., Wm., Newark, N. J.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Windmaster Div., Lima Register Co., Lima, O.

CONTROLS, FAN

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman, Inc., Rockford, Ill.
Cam Stat, Inc., Div. of the Paul Henry Co., Los Angeles, Calif.
Cleveland Controls, Inc., Cleveland, O.
Curtis Development & Mfg. Co., Milwaukee, Wis.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Appliance Control Dept., Morrison, Ill.
Hart Mfg. Co., The, Hartford, Conn.
McLarty Systems, Battle Creek, Mich.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Optimum Control Corp., Cleveland, O.
Penn Control, Inc., Goshen, Ind.
Signet Controls, Portland, Ore.
Therm-O-Disc, Inc., Mansfield, O.
White-Rodgers Co., St. Louis, Mo.
Worner Electronic Devices, Rankin, Ill.

CONTROLS, FIRE PROTECTION SPRINKLER SYSTEMS

Allen Mfg. Co., W. D., Bellwood, Ill.
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Clark Controller Co., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Sperti Faraday, Inc., Adrian, Mich.
Synchro-Start Products, Inc., Skokie, Ill.

CONTROLS, FLAME FAILURE

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Baso, Inc., Milwaukee, Wis.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Drying Systems Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Appliance Control Dept., Morrison, Ill.
Haney Burner Div., Southwest Gas Corp., Las Vegas, Nev.
Instruments, Inc., Tulsa, Okla.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Photobell Co., Inc., New York, N. Y.
Photomation, Inc., Bergenfield, N. J.
Protection Controls, Inc., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Stout & Sons, David, St. Louis, Mo.
Teleflex Industrial Products, Inc., Boyertown, Pa.
Webster Engineering Co., Tulsa, Okla.
White-Rodgers Co., St. Louis, Mo.

CONTROLS, HEATING

See Alarms; Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Systems, Combustion Control; Systems, Heating; Thermostats; Valves, Balancing, for Forced Hot Water Heating Systems; Valves, Diaphragm; Valves, Flow Control; Valves, Mixing; Valves, Pressure Reducing and Regulating; Valves, Radiator; Valves, Solenoid

CONTROLS, PUSH-PULL

See Shafts, Flexible, for Control

CONTROLS, REFRIGERATION

See Humidistats; Operators, Valve; Relays; Switches; Thermostats; Valves, Refrigeration; Valves, Solenoid

CONVECTORS

See Radiation, Convection Type

CONVERTORS, STEAM

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alstrom Corp., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Bernstrom, Inc., C. R., Providence, R. I.
Birchfield Boiler, Inc., Tacoma, Wash.
Buxton Mfg. Co., Dover, N. J.
Cooley Co., E. C., San Francisco, Calif.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Ellicott Fabricators, Inc., Baltimore, Md.
General Fittings Co., East Greenwich, R. I.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Mauney, Rowe A., Marion, N. C.
Old Dominion Iron & Steel Corp., Richmond, Va.
Patterson-Kelley Co., Inc., The, East Strouds**burg, Pa.**
Richmond Engineering Co., Richmond, Va.
Taco Heaters, Inc., Cranston, R. I.
Water Tube Boiler & Tank Co., Chicago, Ill.
Yula Corp., Bronx, N. Y.

CONVEYORS, COAL AND ASH

Ajax Flexible Coupling Co., Inc., Westfield, N. Y.
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Auburn Foundry Inc., Heating Div., Auburn, Ind.
Bil-Jax, Inc., Archbold, O.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I. (continuous weighing)
Canton Stoker Corp., Canton, O.
Chain Belt Co., Milwaukee, Wis.
Cleveland Crane & Eng. Co., Wickliffe, O.
Dayton Automatic Stoker Co., Dayton, O.
Electric Furnace-Man, Inc., Emmaus, Pa. (mechanical and pneumatic)
Fluor Products Co., Santa Rosa, Calif.
Hager & Son, Inc., Rockford, Ill.
Hewitt-Robins, Inc., Stamford, Conn.
Jeffrey Mfg. Co., Columbus, O.
Johnston & Jennings Co., Cleveland, O.
Joy Mfg. Co., Pittsburgh, Pa.
Kol-Master Corp., Oregon, Ill.
Link-Belt Co., Chicago, Ill.
New London Engineering Co., New London, Wis.
Spurgeon Co., Warren, Mich.
Stephens-Adamson Mfg. Co., Aurora, Ill.
United States Rubber Co., New York, N. Y. (belts)

Whitty Co., Inc., Boston, Mass.
Will-Burt Co., The, Orrville, O.

COOLERS, CRANE CAB

Anderson-Snow Corp., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Ellis & Watts Products, Inc., Cincinnati, O.
Lintern Corp., Painesville, O.
Trane Co., The, LaCrosse, Wis.

COOLERS, EVAPORATIVE

See Unitary Air Conditioners, Summer, Evaporative Cooling Type

COOLERS, OIL

Acme Industries, Inc., Jackson, Mich.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Aloo Products, Inc., Schenectady, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American-Standard Industrial Div., Detroit.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., West Chester, Pa.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg. Co., Dover, N. J.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Ellis & Watts Products, Inc., Cincinnati, O. (solvent)
Fedders Corp., Buffalo, N. Y.
Fluor Products Co., Santa Rosa, Calif.
G & O Mfg. Co., New Haven, Conn.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Griffin & Co., Louisville, Ky.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Imeco, Inc., Chicago, Ill.
Industrial Products Div., Perfex Corp., Milwaukee, Wis.
Kellogg Co., The, M. W., New York, N. Y.
Manning & Lewis Engineering Co., Newark.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Warren, Pa.
Super Radiator Corp., Minneapolis, Minn.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Vogt Machine Co., Henry, Louisville, Ky.
Whitlock Mfg. Co., W. Hartford, Conn.
Yates-American Machine Co., Heat Transfer Products Div., Beloit, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Corp., Bronx, N. Y.

COOLERS, UNIT (FLOOR TYPE)

Not air conditioning units, but floor mounted unit with coil and centrifugal fans without filters, for connection to remote compressor or cold water supply. For air conditioning units see Unitary Air Conditioners

Auburn Burner Co., Auburn, Ind.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Reco Products Div., Recony Corp., New York, N. Y.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

COOLERS, UNIT (SUSPENDED TYPE)

Not air conditioning units, but suspended unit with coil and propeller fan, without filters, for connection to remote compressor or cold water supply. For air conditioning units, see Unitary Air Conditioners

American Cooling Tower Co., Kansas City, Mo.
Bohn Aluminum & Brass Corp., Betz Div., Danville. Ill.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Frigid Coil, Inc., El Monte, Calif.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
Master-Bilt Refrigeration Mfg. Co., St. Louis.
McQuay, Inc., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
Watkins Co., J. E., Maywood, Ill.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

COOLING COILS

See Surface Finned Cooling

COOLING COILS, FINNED

See Surface, Finned, Cooling

COOLING SURFACE

See Surface Finned Cooling

COOLING TOWERS

See Towers, Cooling

COOLING UNITS

See Unitary Air Conditioners; Coolers, Unit

COPPER PIPE

See Pipe, Brass and Copper

COPPER SHEETS

See Sheets, Copper

COPPER TUBE FITTINGS

See Fittings, Copper Tube

COPPER TUBE FITTINGS, FLARED

See Fittings, Copper Tube, Flared

COPPER TUBING

See Tubing, Brass and Copper

CORROSION PREVENTIVES

See Devices, Electrolytic, for Preventing Corrosion; Treatment, Steam System, to Inhibit Corrosion; and Treatment, Water, to Inhibit Corrosion

COUNTERS, DUST

Bausch & Lomb Optical Co., Rochester, N. Y.
Day Co., The, Minneapolis, Minn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Mine Safety Appliances Co., Pittsburgh, Pa.
Willson Products Div., Reading, Pa.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Coupling Co., Inc., Westfield, N. Y.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich. (Universal joints)
Boston Gear Wks., Quincy, Mass.
Brooks Equipment Corp., Hoboken, N. J.
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Certified Flexible Couplings, Inc., Mt. Vernon, N. Y.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clark Flexible Link Shaft Co., Newton Highlands, Mass.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
De Lavel Steam Turbine Co., Trenton, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Guardian Products Corp., Michigan City, Ind.
Hewitt-Robins, Inc., Stamford, Conn.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Link Belt Co., Chicago, Ill.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O. (automatic centrifugal clutch)
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Corp., Philadelphia, Pa.
Piezo Mfg. Corp., Staten Island, N. Y.
Poole Foundry & Machine Co., Baltimore, Md.
Ramsey Products Corp., Albany, N. Y.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Thomas Flexible Coupling Co., Warren, Pa.
Waldron Corp., John, New Brunswick, N. J. (pin type and gear type)
Whitney Chain Co., Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.
Zurn Industries, Inc., Erie, Pa.

COUPLINGS, PIPE

Acheson Mfg. Co., Rankin, Pa.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.

Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo. (brass)
Baker & Co., R. H., Los Angeles, Calif.
Band-It Co., Denver, Colo.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Camco Fittings Inc., North Haven, Conn. (stainless)
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Clayton Mark & Co., Evanston, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cooper-Alloy Corp., Hillside, N. J. (stainless)
Dahl Co., Inc., G. W., Bristol, R. I.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Electric Steel Foundry Co., Portland, Ore.
Fibercast Co., Sand Spring, Okla.
Fischer & Porter Co., Hatboro, Pa. (glass to glass; glass to metal)
Flagg & Co., Inc., Stanley G., Philadelphia.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
Garlock Packing Co., The, Palmyra, N. Y.
Gilbert Brass Foundry Co., St. Louis, Mo.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC)
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Illinois Malleable Iron Co., Chicago, Ill.
Johns-Manville, New York, N. Y. (asbestos - cement)
King Union Co., Inc., Hillsgrove, R. I.
Ladish Co., Cudahy, Wis.
Lenz Co., Dayton, O.
Malleable Iron Fittings Co., Branford, Conn.
Morris Coupling & Clamp Co., Kittanning, Pa.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N. Y. (brass)
OPW - Jordan, Cincinnati, O.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pipeline Coatings & Engineering Co., Los Angeles, Calif.
Pipe Line Development Co., Cleveland, O.
Pipe Plugs, Inc., Wellington, O.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J. (forged steel & stainless steel)
Rhode Island Fittings Co., Providence, R. I. (malleable)
Smith-Blair, Inc., S. San Francisco, Calif.
Southern Pipe Div. of U. S. Industries, Inc., Azusa, Calif.
Spanco Brass Sales, Allegan, Mich.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Star Stainless Screw Co., Paterson, N. J.
Star Tubular Products Co., Chicago, Ill.
Steel Improvement & Forge Co., The, Cleveland, O.
Stockham Valve & Fittings, Birmingham, Ala.
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (unplasticized polyvinyl chloride)
Swepco Tube Corp., Clifton, N. J.
Tube Turns Div. of Chemetron Corp., Louisville, Ky. (welding couplings)
Tube Turns Plastics, Inc., Louisville, Ky. (UPVC)
Tubular Div., The National Supply Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.
United States Stoneware Co., New York, N. Y.
Victaulic Co. of America, Elizabeth, N. J.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y. (steel, plastic and stainless)
Ward Foundries, Inc., J. P., Blossburg, Pa.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wheatland Tube Co., Philadelphia, Pa. (steel)
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

COUPLINGS, PIPE, DETACHABLE

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Airaterra (Roylyn Products), Glendale, Calif.
Airserco Mfg. Co., Pittsburgh, Pa.
Allegheny Valve Co., Warren, Pa.
Alloy Stainless Products Co., Totowa, N. J.
American Flow Control Corp., Houston, Tex.
Anchor Coupling Co., Inc., Libertyville, Ill. (hose)
Baker & Co., R. H., Los Angeles, Calif.
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC)
Hunt Valve Co., Salem, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Joslyn Mfg. & Supply Co., Chicago, Ill.
Morris Coupling & Clamp Co., Kittanning, Pa.
OPW-Jordan, Cincinnati, O.
Smith Bros. Co., Oak Park, Ill.
Snap-Tite, Inc., Union City, Pa.
Swepco Tube Corp., Clifton, N. J.
Victaulic Co. of America, Elizabeth, N. J.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Zalo Mfg. Co., Cleveland, O.

COUPLINGS, TUBING, REFRIGERANT, RUPTURE, FOR INSTALLING FACTORY CHARGED REFRIGERATION EQUIPMENT

Aeroquip Corp., Jackson, Mich.
Anchor Coupling Co. Inc., Libertyville, Ill.
Snap-Tite, Inc., Union City, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.

COVERS, PROTECTIVE, VALVE AND FLANGE

Clover Industries, Inc., Tonawanda, N. Y.
Neirad Industries, Inc., Darien, Conn.

COVERS, PROTECTIVE, FOR WINDOW AIR CONDITIONERS

Bemis Bro. Bag Co., St. Louis, Mo.
Blossom Mfg. Co., Inc., Brooklyn, N. Y.
Budlew Products Co., Chicago, Ill.
Canvas Products Co., St. Louis, Mo.
International Covers for Air Conditioners Corp., New York, N. Y.
Tulsa Canvas Products Co., Inc., Tulsa, Okla.
Wagner Awnings & Mfg. Co., Cleveland, O.
Wickford Products, Inc., New York, N. Y.
Wilmington Plastics Co., Wilmington, Del.

CRANE CAB COOLERS

See Coolers, Crane Cab

CROP DRYERS

See Dryers, Crop

CUT-OFFS, LOW WATER, HEATING BOILER

Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Magnetrol Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Newark Controls Co., Bloomfield, N. J.
Reliance Gauge Column Co., Cleveland, O.
Schaub Engineering Co., Fred H., Chicago.
Watts Regulator Co., Lawrence, Mass.

CUTTERS, FLAME FOR PIPING

H & M Pipe Beveling Machine Co., Tulsa, Okla.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Div., Chemetron Corp., Chicago, Ill.
Orbit Sales Co., Inc., New Haven, Conn.
Steffan Mfg. Corp., Salem, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

CUTTERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Baker & Co., R. H., Los Angeles, Calif.
Barnes Tool Co., The, Lexington, Mass.
Beaver Pipe Tools, Inc., Warren, O. (knife and wheel)
Clow & Sons, Inc., James B., Chicago, Ill.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich. (metal cutting band saw)
Kenco Mfg. Co., Los Angeles, Calif. (abrasive)
Landis Machine Co., Inc., Waynesboro, Pa.
M-M-A, Inc., Lancaster, Pa.
Nye Tool Co., Chicago, Ill.
Obear & Sons, Inc., Inglewood, Calif. (abrasive)
Oster Mfg. Co., Wickliffe, O. (portable power)
Pilot Mfg. Co., Torrance, Calif. (asbestos-cement)
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Saunders Mfg. Co., Yonkers, N. Y.
Springload Mfg. Corp., Seattle, Wash. (cast iron, clay, asbestos, cement)
Steffan Mfg. Corp., Salem, O.
Stratford Pipe Scalloper Co., Clearwater, Fla. (combined with template maker)
Talon Tools, Inc., North Arlington, N. J. (chain type)
Toledo Pipe Threading Machine Co., Toledo, O. (wheel, knife)
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wachs Co., E. H., The, Chicago, Ill. (portable electric and air drive)
Wallace Supplies Mfg. Co., Chicago, Ill. (abrasive)
Wheeler Mfg. Co., The, Ashtabula, O. (hydraulic and manual)

CUTTERS, TUBING

Airetool Mfg. Co., Springfield, O.
Anderson Metals Corp., Kansas City, Mo.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Couplings Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Fenway Machine Co., Philadelphia, Pa. (also sheet metal)
Fine Products Co., Berwyn, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenco Mfg. Co., Los Angeles, Calif. (abrasive)
Landis Machine Co., Inc., Waynesboro, Pa.
Miller Mfg. Co., St. Paul, Minn.
Mueller Brass Co., Port Huron, Mich.
Nye Tool Co., Chicago, Ill.
Obear & Sons, Inc., Inglewood, Calif.
Oster Mfg. Co., Wickliffe, O. (portable power)
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wallace Supplies Mfg. Co., Chicago, Ill.

Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.
Wiedeke Co., The Gustav, Dayton, O.
Wilson Manufacturing Co., Memphis, Tenn.

CYLINDERS, AIR OR HYDRAULIC

Airmatic Valve, Inc., Cleveland, O.
Commercial Shearing & Stamping Co., Youngstown, O.
Hanna Engineering Wks., Chicago, Ill.
Ledeen Mfg. Co., El Monte, Calif.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.

DAMPERS, AIR, BACK-DRAFT

Air Conditioning Products Co., Detroit, Mich.
Air Control Products, Inc., Coopersville, Mich.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., Inc., Stillwater, Minn.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Maple City Furnace Co., Monmouth, Ill.
Senrac Industries, Madison, Wis.
United States Register Co., Battle Creek, Mich.

DAMPER OPERATORS

See Operators, Damper

DAMPER REGULATORS

See Regulators, Damper Sets

DAMPERS, DIFFUSER

Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles, Calif.
Air-Factors, Inc., Covina, Calif.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Gallaher Co., The, Omaha, Neb.
General Air Products Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Lima Register Co., Lima, O.
Round Oak Co., Inc., Dowagiac, Mich.
Smith Co., J. B., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, MANUALLY OPERATED

Adams Co., The, Dubuque, Ia.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Conditioning Products Co., Detroit, Mich.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air-Factors, Inc., Covina, Calif.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo.
Ammerman Co., Inc., Stillwater, Minn.
Anemostat Corp. of America, New York, N. Y.
Arex Co., Chicago, Ill.
Armstrong Fittings Co., Des Moines, Ia.
Atcor, Inc., Warren, Mich.
Barber-Colman Co., Rockford, Ill.
Cain Mfg. Inc., Birmingham, Ala.
Champion Furnace Pipe Co., Peoria, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Corite Products, Inc., Chicago, Ill. (plastic)
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
General Air Products Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Imperial Damper Co., New York, N. Y.
Inland Steel Products Co., Milwaukee, Wis.
Johnson Service Co., Milwaukee, Wis.
Krueger Air Conditioning Co., Tucson, Ariz.
Lennox Industries Inc., Marshalltown, Ia.
Maple City Furnace Co., Monmouth, Ill.
Marsto Machine Co., West Quincy, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Round Oak Co., Inc., Dowagiac, Mich.
Seelye Craftsmen, Inc., Minneapolis, Minn.
Thermotank, Inc., Products Div., Detroit.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Union Iron Wks., Erie, Pa.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Warren Register and Grilles, Inc., Miami, Fla.
Waterloo Register Co., Inc., Waterloo, Ia.
Williamson Co., Cincinnati, O.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, REMOTE CONTROLLED

Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo.
Anemostat Corp. of America, New York.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Combustion Equipment Co., Moline, Ill.
Connor Engineering Corp., Danbury, Conn.
Controlair Mfg. Co., Los Angeles, Calif.
Imperial Damper Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Maple City Furnace Co., Monmouth, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Seelye Craftsmen, Inc., Minneapolis, Minn.
Thermotank, Inc., Products Div., Detroit.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Union Iron Wks., Erie, Pa.
Vapor Heating Corp., Chicago, Ill.
Young Regulator Co., Cleveland, O.

DAMPERS, FIRE, FUSIBLE LINK

Air Conditioning Products Co., Detroit, Mich.
Air-Factors, Inc., Covina, Calif.
Air-Path Products Co., Baltimore, Md.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., Inc., Stillwater, Minn.
Anemostat Corp. of America, New York, N. Y.
Arex Co., Chicago, Ill.
Atcor, Inc., Warren, Mich.
Controlair Mfg. Co., Los Angeles, Calif.
Haertel Co., Walter, Minneapolis, Minn.
Imperial Damper Co., New York, N. Y.
Krueger Air Conditioning Co., Tucson, Ariz.
Maple City Furnace Co., Monmouth, Ill.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Seelye Craftsmen, Inc., Minneapolis, Minn.
Senrac Industries, Madison, Wis.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland, O.

DAMPERS, PULSATION, FOR PIPING SYSTEMS

Campbell Co., J. A., Long Beach, Calif.
Chemiquip Co., New York, N. Y.
Greer Hydraulics, Inc., Jamaica, N. Y.
Industrial Acoustics Co., Inc., New York.
Taylor Instrument Companies, Rochester, N. Y.
United States Register Co., Battle Creek, Mich.

DEAERATORS

Acker Corp., Meridian, Miss.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Standard Industrial Div., Detroit, Mich.
American Water Softener Co., Philadelphia.
Baker, Inc., C. I., Lorain, O.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elgin Softener Corp., Elgin, Ill.
Elliott Co., Jeannette, Pa.
General Filter Co., Ames, Ia.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Graver Water Conditioning Co., New York.
Hoppes Mfg. Co., Inc., Springfield, O.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stickle Steam Specialties Co., Indianapolis, Ind.
Whitlock Mfg. Co., W. Hartford, Conn.
Worthington Corp., East Orange, N. J.

DEEP WELL PUMPS

See Pumps, Deep Well

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

Abbeon Supply Co., Jamaica, N. Y.
Air Conditioning Engineering Co., Cambridge, Mass.
Bryant Mfg. Co., Indianapolis, Ind.
Cargocaire Engineering Corp., New York.
Desomatic Products, Inc., Falls Church, Va.
Dow Chemical Co., The, Midland, Mich.
Dryomatic Corp., Alexandria, Va.
Ellis & Watts Products, Inc., Cincinnati, O.
Floridin Co., Tallahassee, Fla.
Gannon Co., Russell R., Cincinnati, O.
Kaufman Co., H. J., Detroit, Mich.
Mobil Oil Co., Inc., New York, N. Y.
Niagara Blower Co., New York, N. Y.
Pittsburgh Lectrodryer Div., McGraw-Edison Co., Pittsburgh, Pa.
Surface Combustion Corp., Toledo, O.
Tamms Industries Co., Chicago, Ill.
Universal Dynamics Corp., Arlington, Va.

DEHUMIDIFIERS FOR COMPRESSED AIR

Adams Co., Inc., R. P., Buffalo, N. Y.
Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.
Bryant Mfg. Co., Indianapolis, Ind.
Centrifix Corp., Cleveland, O.
Desomatic Products, Inc., Falls Church, Va.
Dryomatic Corp., Alexandria, Va.
Ellis & Watts Products, Inc., Cincinnati, O.
Hankison Corp., Canonsburg, Pa.
Kaufman Co., H. J., The, Detroit, Mich.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Lectrodryer Div., McGraw-Edison Co., Pittsburgh, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Selas Corp. of America, Dresher, Pa.

DEHUMIDIFIERS, ELECTRIC PLUG-IN, FOR SMALL SPACES

Abbeon Supply Co., Jamaica, N. Y.
Addison Products Co., Addison, Mich.
Admiral Corp., Chicago, Ill.
Amana Refrigeration, Inc., Amana, Ia.
Blissfield Mfg. Co., Blissfield, Mich.
Cargocaire Engineering Corp., New York, N. Y.
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Dryomatic Corp., Alexandria, Va.
Ebco Mfg. Co., Columbus, O.
Fedders Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Gibson Refrigerator Co., Greenville, Mich.
Haertel Co., Walter, Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.

Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Westinghouse Electric Corp., Electric Appliance Divisions, Columbus, O.
Whirlpool Corp., St. Joseph, Mich.

DEHUMIDIFIERS, SPRAY

See Washers, Air

DEHUMIDIFIERS, SPRAYED COIL

Air & Refrigeration Corp., New York, N. Y.
American-Standard Industrial Div., Detroit, Mich.
Blazer & Son, M., Passaic, N. J.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Governair Corp., Oklahoma City, Okla.
Kennard Products, American Air Filter Co., Louisville, Ky.
Marlo Coil Co., St. Louis, Mo.
Thermal Engineering Corp., Houston, Tex.
Trane Co., LaCrosse, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

DEHUMIDIFYING UNITS

See Unitary Air Conditioners; Dehumidifiers

DEHYDRANT AND ACID NEUTRALIZER, FOR REFRIGERATING SYSTEMS

Allin Mfg. Co., Chicago, Ill.
Berna Corp., Garwood, N. J.
Grace & Co., W. R., Davison Chemical Div., Baltimore, Md.
Highside Chemicals, Inc., Clifton, N. J.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.

DEHYDRATORS, REFRIGERANT

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Aluminum Co. of America, Pittsburgh, Pa.
American-Standard Detroit Controls Div., Detroit, Mich.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Belt-Ice Corp., Seattle, Wash.
Berna Corp., Garwood, N. J.
Eagle Chemical Co., Inc., Mobile, Ala.
Floridin Co., Tallahassee, Fla.
Frigidaire Div., General Motors Corp., Dayton, O.
Hankison Corp., Canonsburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mobil Oil Co., Inc., New York, N. Y.
Mueller Brass Co., Port Huron, Mich.
Refrigeration Research, Inc., Brighton, Mich.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., New York, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Tube Manifold Corp., North Tonawanda, N. Y.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Wabash Corp., Chicago, Ill.

DENSIFIERS, CONCRETE, FOR INCREASING THERMAL CONDUCTIVITY

Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.

DESTROYERS, SOOT, CHEMICAL

Acme Chemical Co., Milwaukee, Wis.
Allen Co., Inc., L. B., Schiller Park, Ill.
Allen Co., Robert G. Mechanicsville, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Coughlan Co., G. N., West Orange, N. J.
General Filters, Inc., Novi, Mich.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Madison, N. J.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y
Nalco Chemical Co., Chicago, Ill.
Normal Chemical Co., St. Paul, Minn.
North American Mogul Products Co., Cleveland, O. (flue and chimney cleaners)
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., New York, N. Y.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Tamms Industries Co., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.

DESUPERHEATERS, STEAM

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Foster Wheeler Corp., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Springfield Boiler Co., Springfield, Ill.
Union Iron Wks., Erie, Pa.
Whitlock Mfg. Co., W. Hartford, Conn.

DETECTORS, CARBON MONOXIDE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Nutt Co., Buell W., Los Angeles, Calif.

DETECTORS, LEAK, FUEL OIL

American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Mine Safety Appliances Co., Pittsburgh, Pa.
Photobell Co., Inc., New York, N. Y.
Yula Corp., Bronx, N. Y.

DETECTORS, LEAK, PIPING

American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y. (gas, hydrogen, nitrogen, oxygen, ammonia, chloride)
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Met-L-Chek Co., Los Angeles, Calif.
National Aniline Div., Allied Chemical Corp., New York, N. Y.
Oxygen Equipment & Service Co., Chicago, Ill.
Smith Chemical Co., E. W., La Puente, Calif.
Universal Controls Corp., Dallas, Tex.
Wilkinson Products Co., Pasadena, Calif.
Winton Products Co., Charlotte, N. C.
Zaco Laboratories, Cleveland, O.

DETECTORS, LEAK, REFRIGERANT

Airserco Mfg. Co., Pittsburgh, Pa.
Allin Mfg. Co., Chicago, Ill.
American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.
Bernz Co., Otto, Rochester, N. Y.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Chicago Forging and Mfg. Co., Chicago, Ill.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Devco Engineering, Inc., Control Systems Div., Caldwell, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Goss Gas, Inc., Glenshaw, Pa.
Highside Chemicals, Inc., Clifton, N. J.
Insto-Gas Corp., Detroit, Mich.
Justrite Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Warren, Mich.
Kidde Mfg. Co., Inc., Bloomfield, N. J.
Lenk Mfg. Co., Franklin, Ky.
Linde Co., Div of Union Carbide Corp., New York, N. Y.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas, Div. of Chemetron Corp., Chicago, Ill.
Smith Welding Equipment Corp., Minneapolis.
Turner Corp., Sycamore, Ill.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Weldit, Inc., Detroit, Mich.

DETECTORS, LEAK, UNDERGROUND PIPING

Fisher Research Laboratory, Inc., Palo Alto, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Globe Phone Mfg. Co., Reading, Mass.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliances Co., Pittsburgh, Pa.

DETECTORS, SMOKE

See Indicators, Smoke; Alarms, Smoke

DETECTORS, VIBRATION

American District Telegraph Co., New York, N. Y.
EPIC, Inc., New York, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Korfund Co., Inc., Long Island City, N. Y.
Scott, Inc., H. H., Inst. Div., Maynard, Mass.

DEVICES, ELECTROLYTIC, FOR PREVENTING CORROSION

American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Electro Rust-Proofing Corp., Belleville, N. J.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
Harco Corp., Cathodic Protection Div., Cleveland, O.
Magnode Products, Inc., Trenton, O.
Marlo Coil Co., St. Louis, Mo.
May Company, Galesburg, Ill.
National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
Patrol Valve Co., The, Cleveland, O.
Rotometals, San Francisco, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Steelcote Mfg. Co., St. Louis, Mo.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.

DEW POINT INDICATORS

See Indicators, Dew Point

DIAPHRAGM VALVES

See Valves, Diaphragm

DIESEL ENGINES

See Engines, Diesel, for Fan, Pump and Compressor Drives

DIFFUSERS, AIR, BASEBOARD

A. & A. Register Co., Cleveland, O.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Covina, Calif.
Airfloor Co. of California, Inc., Norwalk, Calif.
Auer Register Co., Cleveland, O.
Carnes Corp., Verona, Wis.
Coleman Co., Inc., The, Wichita, Ks.
Corbman Bros., Inc., Philadelphia, Pa.
General Air Products Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Heating Assurance, Inc., Spokane, Wash.
Independent Register Co., Cleveland,O.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lima Register Co., Lima, O.
Midco Register Corp., St. Paul, Minn.
National Grille & Register Co., Cleveland, O.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Thermo-Base Div., Gerwin Industries, Inc., Michigan City, Ind.

Titus Mfg. Corp., Waterloo, Ia.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSERS, AIR, CEILING

See also Grilles; Panels, Perforated, for Air Diffusions; Registers

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles, Calif.
Air-Factors, Inc., Covina, Calif.
AirGuide Plastics Corp., Miami, Fla. (molded nylon)
Anemostat Corp. of America, New York, N. Y.
Ashburn Supply Co., Culver City, Calif.
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
B-G Engineering Co., Houston, Tex.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Gallaher Co., The, Omaha, Neb.
General Air Products Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lenly Mfg. Co., Inc., Los Angeles, Calif.
Lima Register Co., The, Lima, O.
Metal Mfg. Co., Ft. Lauderdale, Fla.
Midco Register Corp., St. Paul, Minn.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Smith Co., J. B., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSERS, AIR, CEILING WITH COMBINED LIGHTING FIXTURE

Air Devices, Inc., New York, N. Y.
Air-Factors, Inc., Covina, Calif.
Anemostat Corp. of America, New York.
Barber-Colman Co., Rockford, Ill.
Carnes Co., Verona, Wis.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Universal Diffuser Corp., Tuckahoe, N. Y.
Wakefield Co., The, Vermilion, O.

DIFFUSERS, AIR, FLOOR

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York, N. Y.
Auer Register Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Lenly Mfg. Co., Inc., Los Angeles, Calif.
Lima Register Co., Lima, O.
Ritter Pattern & Casting Co., Inc., New York.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSERS, AIR, HIGH PRESSURE

Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSERS, AIR, WALL

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles.
Air-Factors, Inc., Covina, Calif.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York, N. Y.
Auer Register Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
General Air Products Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lenly Mfg. Co., Inc., Los Angeles, Calif.
Lima Register Co., Lima, O.
Metal Industries, Inc., Clearwater, Fla.
Midco Register Corp., St. Paul, Minn.
National Grille & Register Co., Cleveland, O.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Ia.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSION, AIR

See Panels, Perforated, for Air Diffusion

DISTRIBUTORS, REFRIGERANT, FOR COOLING COILS

Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
General Controls Co., Glendale, Calif.
Refrigeration Research, Inc., Brighton, Mich.
Sporlan Valve Co., St. Louis, Mo.

DISTRIBUTORS, WATER, FOR CONDENSERS

Hubbell Corp., Mundelein, Ill.
Vilter Mfg. Co., The, Milwaukee, Wis.

DOOR CONTROLS

See Controls, Door, Electric Eye

DOOR GRILLES

See Grilles, Door

DOORS AND PANELS, ACCESS

Adams Co., The, Dubuque, Ia.
Air Control Products, Inc., Coopersville, Mich.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Metal Works, Inc., New Orleans, La.
Ammerman Co., Inc., Stillwater, Minn.
Auer Register Co., Cleveland, O.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Camloc Fastener Corp., Paramus, N. J. (Fasteners for access panels and sheet metals)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Falstrom Co., Passaic, N. J.
Haertel Co., Walter, Minneapolis, Minn.
Hohman & Bernard Inc., New York, N. Y.
Inland Steel Products Co., Milwaukee, Wis.
Knapp Bros. Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Technical Ply-Woods Sales, Chicago, Ill.
Ventfabrics, Inc., Chicago, Ill.
Walsh-Hannon-Gladwin, Inc., Boston, Mass.
Western Wire & Iron Works, Inc., Chicago, Ill. **(Metal)**
Zurn Industries, Inc., Erie, Pa.

DOORWAYS, AIR CURTAIN, FOR LARGE ENTRANCES

(Including nozzles, fans, ducts, heating and cooling coils, etc.)

American Air Curtain Corp., St. Louis, Mo.
Dunham-Bush, Inc., West Hartford, Conn.
New Castle Products, Inc., New Castle, Ind.

DOUBLE DUCT MIXING UNITS, SOUND AND VOLUME CONTROL, FOR AIR CONDITIONING SYSTEMS

See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

DRAFT CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAFT GAGES

See Gages, Indicating, Draft

DRAFT RECORDERS

See Recorders, Draft

DRAFT REGULATORS

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAINS, TANK, FOR HOT WATER HEATING SYSTEM EXPANSION TANKS

Quality Specialty Co., Inc., Camden, N. J.
Thrush & Co., H. A., Peru, Ind.

DRAWING TEMPLATES, PIPING

See Templates, Drawing, Piping

DRIERS

See Dehydrators, Refrigerant

DRILLS, ELECTRIC AND PNEUMATIC, PORTABLE

Airetool Mfg. Co., Springfield, O.
Albertson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.
Dayton Electric Mfg. Co., Chicago, Ill.
Demo-Haines Tool Corp., El Segundo, Calif.
Diamond Products, Inc., Elyria, O.
Gardner-Denver Co., Quincy, Ill.
Hoffacker Machine Tool Co., Cranston, R. I.
Hydrauger Corp., Ltd., San Francisco, Calif.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Molco Drilling Machines, Inc., Washington, D.C.
Nielsen, Inc., E. V., Stamford, Conn.
Portable Electric Tools, Inc., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Rotor Tool Co., Cleveland, O.
Schramm, Inc., West Chester, Pa.
Skil Corp., Chicago, Ill.
Snap-on Tools Corp., Kenosha, Wis.
Speedway Mfg. Co., Div. of Thor Power Tool Co., LaGrange Park, Ill.
Stanley Electric Tools Div., Stanley Works, The, New Britain, Conn.
Tempo Products Co., Cleveland, O.
Thor Power Tool Co., Aurora, Ill.

Truco Masonry Drilling Div., Wheel Trueing Tool Co., Detroit, Mich.
U. S. Electrical Tool Co., Cincinnati, O.
Wen Products, Inc., Chicago, Ill.
Wodack Electric Tool Corp., Chicago, Ill.
Worthington Corp., East Orange, N. J.

DRILLS, MASONRY

Arro Expansion Bolt Co., Marion, O.
Atlas Copco Eastern, Inc., Paramus, N. J.
Chicago Expansion Bolt Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Clipper Mfg. Co., Kansas City, Mo.
Demo-Haines Tool Corp., El Segundo, Calif.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Diamond Products, Inc., Elyria, O. (diamond)
DoAll Co., The, Des Plaines, Ill.
Geo-Drill Co., Bridgeville, Pa.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Hamer-Dril Co., New York, N. Y.
Hamlin Co., Inc., J. F., San Francisco, Calif.
Holub Industries, Inc., Sycamore, Ill.
Ideal Industries, Inc., Sycamore, Ill.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich. (carboloy; cemented carbide)
Mobile Drilling, Inc., Indianapolis, Ind.
Molco Drilling Machines, Inc., Washington, D. C.
New England Carbide Tool Co., Inc., Medford, Mass. (portable drilling machines)
Nielsen, Inc., E. V., Stamford, Conn.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Relton Corp., Pasadena, Calif.
Remington Arms Co., Inc., Bridgeport, Conn.
Skil Corp., Chicago, Ill.
Star Expansion Industries Corp., Mountainville, N. Y.
Super Tool Co., Detroit, Mich.
Tempo Products Co., Cleveland, O.
Thor Power Tool Co., Aurora, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.
Truco Masonry Drilling Div., Wheel Trueing Tool Co., Detroit, Mich.
U. S. Expansion Bolt Co., York, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill.

DRIVES, CHAIN

Boston Gear Works, Quincy, Mass.
Browning Mfg. Co., Maysville, Ky.
Chain Belt Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Ramsey Products Corp., Albany, N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Whitney Chain Co., Hartford, Conn.

DRIVES, COOLING TOWER FAN

Cleveland Worm & Gear Co., Cleveland, O.
Doerr Electric Corp., Cedarburg, Wis.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Maurey Mfg. Corp., Chicago, Ill.
Philadelphia Gear Corp., Philadelphia, Pa.

DRIVES, FLAT BELT

See also Belting, Leather and Belting, Rubber

American Pulley Co., Philadelphia, Pa.
Browning Mfg. Co., Maysville, Ky.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Aurora, Ill.
Rhoads & Sons, J. E., Wilmington, Del.
Williams & Son, I. B., Dover, N. H.
Wood's Sons Co., T. B., Chambersburg, Pa.

DRIVES, FLUID OR HYDRAULIC, FOR POWER TRANSMISSION

American-Standard Industrial Div., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Link Belt Co., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Sundstrand Hydraulics, Rockford, Ill.
Twin Disc Clutch Co., Rockford, Ill
Warner Electric Brake & Clutch Co., Beloit, Wis.
Will-O-Hill Industries, Inc., Willoughby, O.
Zurn Industries, Inc., Erie, Pa.

DRIVES, GEAR

Boston Gear Works, Quincy, Mass.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cleveland Worm & Gear Co., Cleveland, O.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Falk Corp., Milwaukee, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Lima Electric Motor Co., Inc., The, Lima, O.
Link-Belt Co., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Master Electric Co., Div. of Reliance & Engineering Co., Dayton, O.
Philadelphia Gear Corp., Philadelphia, Pa.
Pyott Foundry & Machine Co., Aurora, Ill.
Reliance Electric Engineering Co., Cleveland, O.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Zurn Industries, Inc., Erie, Pa.

DRIVES, POWER FOR PIPE THREADING

Beaver Pipe Tools, Inc., Warren, O.
Oster Mfg. Co., Wickliffe, O.
Ridge Tool Co., Elyria, O.
Toledo Pipe Threading Machine Co., Toledo, O.

DRIVES, SHAFT MOUNTED

American Pulley Co., The, Philadelphia, Pa.
Boston Gear Works, Quincy, Mass.
Dodge Mfg. Corp., Mishawaka, Ind.
Falk Corp., Milwaukee, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Link-Belt Co., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Philadelphia Gear Corp., Philadelphia, Pa.
Salsbury Corp., Los Angeles, Calif.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors Inc., Los Angeles, Calif.

DRIVES, V BELT

American Pulley Co., Philadelphia, Pa.
Browning Mfg. Co., Maysville, Ky.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga.
Hewitt-Robins, Inc., Stamford, Conn.
Horton Mfg. Co., Minneapolis, Minn.
Indus Corp., Indianapolis, Ind.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Link-Belt Co., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Aurora, Ill.
Speed Selector Inc., Chagrin Falls, O.
V-Belt Clutch Co., Los Angeles, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., East Orange, N. J.

DRIVES, VARIABLE SPEED

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

DRYERS, CROP

Campbell Heating Co., Des Moines, Ia.
Clay Equipment Corp., Cedar Falls, Ia.
Day Co., The, Minneapolis, Minn.
Lennox Industries, Inc., Des Moines, Ia.
Link-Belt Co., Chicago, Ill.
National Heater Co., Inc., St. Paul, Minn.
Refrigeration Research, Inc., Brighton, Mich.
Siebring Mfg. Co., George, Ia.
Silent Glow Oil Burner Co., Hartford, Conn.
Zink Co., John, Tulsa, Okla.

DRYERS FOR COMPRESSED AIR

See Dehumidifiers for Compressed Air

DRYERS, INDUSTRIAL (COMPARTMENT, TUNNEL CONVEYOR, VACUUM, SPRAY, ROTARY, ETC.)

Aerotec Corp., The, Greenwich, Conn.
Air & Refrigeration Corp., New York, N. Y.
Beltran Associates, Inc., Brooklyn, N. Y.
Biggs Boiler Works Co., The, E. Akron, O.
Blaw Knox Co., Buflovak Equipment Div., Buffalo. N. Y.
Bowen Engineering, Inc., North Branch, N. J.
Combustion Engineering Inc., New York, N. Y.
Day Co., The, Minneapolis, Minn.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Dryer Electric Corp., Fan Div., Brooklyn, N.Y.
Drying Systems Co., Chicago, Ill.
Griffin & Co., Louisville, Ky.
Jeffrey Mfg. Co., Columbus, O.
Kirk & Blum Mfg. Co., Cincinnati, O.
Link-Belt Co., Chicago, Ill.
Louisville Drying Machinery Unit, General American Transportation Corp., Louisville, Ky.
Mahon Co., R. C., The, Detroit, Mich.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis. (rotary)
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Peters-Dalton, Inc., Detroit, Mich.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Raymond Div., Combustion Engineering Inc., Chicago, Ill.
Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
Schmieg Industries, Inc., Detroit, Mich.
Selas Corp. of America, Dresher, Pa.
Universal Dynamics Corp., Arlington, Va.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Western Precipitation Corp., Los Angeles, Calif.
Whiting Corp., Harvey, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa. (electric)

DRYERS, REFRIGERANT

See Dehydrators, Refrigerant

DUAL THERMOSTATS

See Thermostats, Two Temperature or Dual

DUCT CONNECTIONS

See Connections, Duct, Flexible; Connectors for Non-Metallic Duct Fabrication

DUCT FURNACES

See Heaters, Duct

DUCT HANGING CLAMPS

See Clamps, Beam, Duct Hanging

DUCT HEATERS

See Heaters, Duct

DUCT INSULATION

See Insulation, Duct

DUCT REPAIR KITS

See Kits, Repair for Pipes, Tanks, Valves, Flanges, and ducts

DUCT SILENCERS

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems; Insulation, Duct, Sound Deadening

DUCT TAPE

See Tape, Duct, Adhesive, for Sealing Joints

DUCT THERMOSTATS

See Thermostats, Duct Type

DUCT TURNING VANES

See Vanes, Duct Turning, Prefabricated

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, METALLIC

Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Buckeye Mfg., Inc., Columbus, O.
Coleman Co., Inc., The, Wichita, Kans.
Flexonics Corp., Maywood, Ill.
Jet-Heet, Inc., Englewood, N. J.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Littleford Bros., Inc., Cincinnati, O.
Round Oak Co., Inc., Dowagiac, Mich.
Solar Aircraft Co., San Diego, Calif.

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
United States Rubber Co., New York, N. Y.
Wiremold Co., Hartford, Conn.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, METALLIC

Acer & Whedon, Inc., Medina, N. Y.
Airfloor Co. of California, Inc., Norwalk, Calif.
Armstrong Fittings Co., Des Moines, Ia.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Champion Furnace Pipe Co., Peoria, Ill.
Corbman Bros., Inc., Philadelphia, Pa.
Ervite Corp., Erie, Pa. (enamel lined or glass coated for corrosive fume removal systems)
Excelsior Steel Furnace Co., The, Chicago, Ill.
General Metals, Inc., Greensboro, N. C.
Henry Furnace Co., The, Medina, O.
•Inland Steel Products Co., Milwaukee, Wis.
Lennox Industries Inc., Columbus, O.
Lennox Industries Inc., Marshalltown, Ia.
Meyer & Bro. Co., F., Peoria, Ill.
Middlesex Paper Tube Co., Inc., Lowell, Mass. (impregnated paper tubes)
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
Olsen Mfg. Co., C. A., Elyria, O.
Portland Copper & Tank Wks., Inc., South Portland, Me. (stainless steel)
Pressure Airduct Corp., Skokie, Ill. (for high velocity systems)
Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Robertson Co., H. H., Pittsburgh, Pa.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Williamson Co., Cincinnati, O.
Zack Co., The, Chicago, Ill.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
American Vitrified Products Co., Cleveland, O.
Argo Plastic Products, Cleveland, O.
Atlas Mineral Products Co., Mertztown, Pa.
Ceilcote, Inc., Cleveland, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (Unplasticized polyvinyl chloride)
Corite Products, Inc., Chicago, Ill. (plastic)
DuVerre, Inc., Buffalo, N.Y. (polyester bonded fiber glass)
Electro-Chemical Products Corp., Cleveland, O. (PVC plastic)
General Ceramics Corp., Keasbey, N. J. (plastic)
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Goodrich Industrial Products Co., B. F., Akron, O.
Gustin-Bacon Mfg. Co., Kansas City, Mo. (glass fiber)
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Haveg Industries, Inc., Wilmington, Del. (for fumes)
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC & polyethylene)
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (asbestos — cement pipe)
Knight, Maurice A., Akron, O. (acid-proof)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (PVC; rubber; PVC lined; rigid PVC)
Met-L-Wood Corp., Chicago, Ill. (combination wood and sheet metal)
Molded Fiber Glass Sheet Co., Ashtabula, O.
Owens-Corning Fiberglas Corp., New York, N. Y.
Richkraft Co., Chicago, Ill.
Robinson Clay Product Co., The, Akron, O.
S & C Mfg. Co., Cincinnati, O. (plastic)
Sonoco Products Co., Construction Products Div., Hartsville, S. C.
Straitsville Brick Co., New Straitsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
United States Rubber Co., New York, N. Y.
Woodall Industries, Inc., Detroit, Mich.

DUCTS, FLEXIBLE

See Ducts and Duct Fittings, Prefabricated, Flexible, Non-Flexible, Metallic and Non-Metallic

DUCTS, SPIRAL WELDED

Carrier Corp., Syracuse, N.Y.
United Sheet Metal Co., Columbus, O.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

DYE PENETRANT

See Penetrant, Dye

DUST BAGS FOR DUST COLLECTORS

See Bags, Dust, for Dust Collectors

DUST COLLECTORS

See Collectors, Dust

DUST COUNTERS

See Counters, Dust

ECONOMIZERS, FUEL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bros, Inc., Minneapolis, Minn.
Buxton Mfg. Co., Dover, N. J.
Combustion Engineering Inc., New York.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Ellicott Fabricators, Inc., Baltimore, Md.
Foster Wheeler Corp., New York, N. Y.
Green Fuel Economizer Co., Inc., The, Beacon, N. Y.
Old Dominion Iron & Steel Corp., Richmond, Va.
Richmond Engineering Co., Richmond, Va.
Springfield Boiler Co., Springfield, Ill.
Union Iron Works, Erie, Pa.

EJECTORS, SEWAGE

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Nash Engineering Co., South Norwalk, Conn.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Swaby Mfg. Co., Chicago, Ill.
Weil Pump Co., Chicago, Ill.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

ELBOWS AND TEES, BALANCING, FOR HOT WATER HEATING AND CHILLED WATER SYSTEMS

American-Standard Detroit Controls Div., Detroit, Mich.
Bernstrom, Inc., C. R., Providence, R. I.
Dunham-Bush, Inc., West Hartford, Conn.
Hammond Valve Corp., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis.
New York Brass Foundry, New York, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

ELECTRIC AIR CLEANERS

See Filters, Air, Electrostatic (with outside power source)

ELECTRIC BOILERS AND STEAM GENERATORS

See Generators, Steam, Electric

ELECTRIC DRILLS

See Drills, Electric, Portable

ELECTRIC MOTORS

See Motors, Electric

ELECTRIC PIPE HEATING SYSTEMS

See Systems, Electric Pipe Heating

ELECTRIC RADIANT HEATING

See Panels, Electric Heating

ELECTRIC SHEARS

See Shears, Electric, Portable

ELECTRIC UNIT HEATERS

See Heaters, Unit, Electric Heating Elements

ELECTRICAL AIR FILTERS

See Filters, Air, Electrostatic (with outside power source)

ELECTRODES, ARC WELDING

Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.
American Brass Co., Waterbury, Conn.
Ampco Metals, Inc., Milwaukee, Wis.
Arcos Corp., Philadelphia, Pa.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Central Steel & Wire Co., Chicago, Ill.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Harnischfeger Corp., Milwaukee, Wis.
Hobart Bros. Co., Troy, O.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
Lincoln Electric Co., Cleveland, O.
Linde Co., Div. of Union Carbide Corp., New York, N.Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
McKay Co., Pittsburgh, Pa.
Metal & Thermit Corp., Rahway, N. J.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif. (for hard facing)
National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
National Cylinder Gas, Div. of Chemetron Corp., Chicago, Ill.
Page Steel & Wire, Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Trindl Products, Ltd., Chicago, Ill.

Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

ELECTRODES, OIL BURNER

Auburn SparkPlug Co., Inc., Auburn, N. Y.
Crown Engineer Corp., Keyport, N. J.
Dielectric Products Co., Inc., Jersey City, N. J.
Steinen Mfg. Co., Wm., Newark, N. J.

ELECTROSTATIC AIR FILTERS

See Filters, Air, Electrostatic (with outside power source)

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Works, Three Rivers, Mich.
Bell & Gossett Co., Morton Grove, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
General Automatic Products Corp., Baltimore, Md.
Gorton Heating Corp., Cranford, N. J.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Kaye & McDonald, Inc., West Orange, N. J.
Keeney Mfg. Co., Newington, Conn.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Morheat Corp., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Southern Plastics Co., Columbia, S. C.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

ELIMINATORS, SLUG, REFRIGERANT

Blazer & Son, M., Passaic, N. J.
Patterson-Kelley Co., The, East Stroudsburg, Pa.
Southern Plastics Co., Columbia, S. C.
Watkins Co., J. E., Maywood, Ill.

ENAMELS AND LACQUERS

Acorn Refining Co., Cleveland, O.
Arco Co., The, Cleveland, O.
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (pipeline and waterworks enamels)
Blue Ridge Talc Co., Inc., Henry, Va.
Claronex Products, Inc., Brooklyn, N. Y.
Cordo Chemical Corp., Norwalk, Conn.
Corrosion Control Co., Inc., New York, N. Y.
Debevoise Co., The, Brooklyn, N. Y.
Dennis Chemical Co., St. Louis, Mo.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Glidden Co., The, Cleveland, O.
Glidden Co., Nubian Div., Chicago, Ill.
Hague & Co., Inc., Alfred, Div. of Lacquer & Chemical Corp., Brooklyn, N. Y.
Heresite & Chemical Co., Manitowoc, Wis. (air dry pure phenolic & chlorinated rubber coatings)
Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Horn Companies, A. C., Subsidiary of Sun Chemical Corp., New York, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Interchemical Corp., Finishes Div., Newark, N J.
Irvington Div., Minnesota Mining & Mfg. Co., Irvington, N. J.
Knight, Maurice A., Akron, O.
Koppers Co., Inc., Pittsburgh, Pa.
Krylon, Inc., Norristown, Pa.
Master Mechanics Co., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J.
Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
National Lead Co., New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Sipe & Co., James B., Pittsburgh, Pa.
Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Valdura Div., American-Marietta Co., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Norwood, Mass.
Wilhelm Co., A., Reading, Pa.
Zaco Laboratories, Cleveland, O. (spray units)

ENCLOSURES FOR PERIMETER AIR CONDITIONING SYSTEMS AND AIR CONDITIONING UNITS

Brandt Corp., The, Long Island City, N. Y.
Knapp Bros. Mfg. Co., Cincinnati, O.
Met-L-Wood Corp., Chicago, Ill.
Robertson Co., H. H., Pittsburgh, Pa.
Somers Corp., Detroit, Mich.
Sterling Radiators Co., Inc., Westfield, Mass.

ENCLOSURES, RADIATOR

Brandt Corp., The, Long Island City, N. Y.
Diamond Mfg. Co., Wyoming, Pa.
Hendrick Mfg. Co., Carbondale, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Knapp Bros. Mfg. Co., Cincinnati, O. (also for convectors)
Met-L-Wood Corp., Chicago, Ill.
Somers Corp., Detroit, Mich.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiators Co., Inc., Westfield, Mass.
United Sheet Metal Co., Inc., Columbus, O.

ENGINES, DIESEL, FOR FAN, PUMP AND COMPRESSOR DRIVES

Alco Products, Inc., Schenectady, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Anderson Diesel Engine Co., Philadelphia, Pa.
Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.
Engine & Material Handling Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Fairbanks, Morse & Co., Chicago, Ill.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Harnischfeger Corp., Milwaukee, Wis.
Ingersoll-Rand Co., New York, N. Y.
Onan & Sons Inc., D. W., Minneapolis, Minn.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motors Co., Waukesha, Wis.
Worthington Corp., East Orange, N. J.

ENGINES, GAS, FOR FAN, PUMP AND COMPRESSOR DRIVES

Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Engine & Material Handling Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Fairbanks, Morse & Co., Chicago, Ill.
I.C.E.D., Inc., St. Petersburg, Fla.
Ingersoll-Rand Co., New York, N. Y.
Onan & Sons Inc., D. W., Minneapolis, Minn.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motor Co., Waukesha, Wis.
Worthington Corp., East Orange, N. J.

ENGINES, STEAM, FOR FAN, PUMP AND COMPRESSOR DRIVES

Skinner Engine Co., Erie, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Wachs Co., E. H., The, Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.

EQUIPMENT, BALANCING

Bear Mfg. Co., Industrial Div., Rock Island, Ill. (dynamic)
Gisholt Machine Co., Madison, Wis.
Industrial Balancing Engineers Div., Calkins Machine & Tool Works, East Aurora, N. Y.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

EQUIPMENT INSULATION

See Insulation, Boiler, Tank, and Equipment

EQUIPMENT, RADIOGRAPHIC INSPECTION

General Electric Co., X-Ray Dept., Milwaukee, Wis.
Nuclear Systems, A Div. of the Budd Co., Philadelphia, Pa.

EVAPORATIVE CONDENSERS

See Condensers, Refrigerating, Evaporative

EVAPORATIVE COOLERS

See Unitary Air Conditioners, Summer, Evaporative Cooling Type

EVAPORATORS

See Chillers, Water

EXCHANGERS, HEAT, FOR AIR TO AIR HEAT RECOVERY

See Units, Heat Recovery, Air to Air

EXCHANGERS, HEAT, SHELL AND TUBE

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y. (liquid to gas)
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American-Standard Industrial Div., Detroit, Mich.
Armstrong Co., Richard M., West Chester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Berlin Chapman Co., Berlin, Wis.
Bernstrom, Inc., C. R., Providence, R. I.
Biggs Boiler Wks. Co., The, E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Buxton Mfg. Co., Dover, N. J.
Carrier Corp., Syracuse, N. Y.
Cleaver-Brooks Co., Milwaukee, Wis.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. Y.
Cooley Co., E. C., San Francisco, Calif.
Corning Glass Works, Corning, N. Y.
Croil-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Degree Corp., Kansas City, Kans.

Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Dowingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Duriron Co., The, Dayton, O. (corrosion resisting)
Electric Steel Foundry Co., Portland, Ore.
Ellicott Fabricators, Inc., Baltimore, Md.
Foster Wheeler Corp., New York, N. Y.
Frick Co., Waynesboro, Pa.
Gabriel Boiler Co., Portland, Ore.
General Fittings Co., East Greenwich, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Griscom-Russell Co., The, Massillon, O.
Haveg Industries, Inc., Wilmington, Del. (plastic)
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Industrial Filter & Pump Co., Cicero, Ill.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Killebrew Engineering Corp., St. Louis, Mo.
Knapp Mills, Inc., Long Island City, N.Y.
Kopperman & Sons, Inc., Joseph, Philadelphia, Pa.
Lindy Heaters, Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Brass Co., Port Huron, Mich.
National Carbon Co., A Div. of Union Carbide Corp., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Nooter Corp., St. Louis, Mo.
Old Dominion Iron & Steel Corp., Richmond, Va.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (roll bond panels incorporating fluid passages)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Process Engineering, Inc., Methuen, Mass.
Reco Products Div., Recony Corp., New York, N. Y.
Richmond Engineering Co., Richmond, Va.
Rite Engineering & Mfg. Corp., Downey, Calif.
Roessing Mfg. Co., Pittsburgh, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Shutt Process Equipment Corp., St. Louis. Mo.
Sims Co., Erie, Pa.
Solar Aircraft Co., San Diego, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Stout & Sons, David, St. Louis, Mo.
Struthers Wells Corp., Warren, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taco Heaters, Inc., Cranston, R. I.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Texas Metal Fabricating Co., Houston, Tex.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Union Iron Works, Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vapor Heating Corp., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Water Tube Boiler & Tank Co., Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whitlock Mfg. Co., W. Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (electric)
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., East Orange, N. J.
Yates-American Machine Co., Heat Transfer Products Div., Beloit, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.
Yula Corp., Bronx, N. Y.

EXCHANGERS, HEAT, REFRIGERANT SUCTION LINE

Acme Industries, Inc., Jackson, Mich.
Armstrong Co., Richard M., West Chester, Pa.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Frigid Coil, Inc., El Monte, Calif.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kaiser Co., E. B., Glenview, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Research, Inc., Brighton, Mich.
Rempe Co., Chicago, Ill.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Water Tube Boiler & Tank Co., Chicago, Ill.
Witt Co., A. H., Los Angeles, Calif.

EXHAUST HEADS

See Heads, Exhaust, for Pipe Lines

EXHAUST VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

EXHAUSTERS

See Units, Exhauster, Centrifugal Fan

EXHAUSTERS, WELDING FUME

Airfan Engineering Co., Los Angeles, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Machine Products Co., Marshalltown, Ia.
American-Standard Industrial Div., Detroit.
Ammerman Co., Inc., Stillwater, Minn.
Barry Blower Co., Minneapolis, Minn.
Bertram Co., Harvey P., The, Cincinnati, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Day Co., The, Minneapolis, Minn.
DeVilbiss Metal Fabricators Co. Detroit, Mich.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Engwald Corp., The, Inwood, Long Island, N. Y.
Gallaher Co., The, Omaha, Neb.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
Kody Blower Co., Trenton, N. J.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Quickdraft Corp., Canton, O.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Ruemelin Mfg. Co., Milwaukee, Wis.
Torit Mfg. Co., St. Paul, Minn.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

EXPANDERS, TUBE

Airetool Mfg. Co., Springfield, O.
Burr Oak Tool & Gauge Co., Sturgis, Mich.
Chicago Pneumatic Tool Co., New York, N. Y.
Crane Packing Co., Morton Grove, Ill.
Elliott Co., Jeannette, Pa.
Henderer's Sons, A. L., Wilmington, Del.
Hill, Inc., Walter P., Detroit, Mich.
Talon Tools, Inc., North Arlington, N. J.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vernon Tool Co., Ltd., Alhambra, Calif.
Wiedeke Co., The Gustav, Dayton, O.
Wilson, Inc., Thomas C., Long Island City, N. Y.

EXPANSION BENDS

See Bends, Expansion

EXPANSION BOLTS

See Bolts, Expansion

EXPANSION JOINTS

See Joints, Pipe Expansion

EXPANSION TANKS

See Tanks, Expansion, for Hot Water Heating Systems

EXPANSION VALVES

See Valves, Refrigeration

EXTENSIONS, FURNACE, WATER WALL, FOR BOILERS

Crotty Mfg. Corp., Flushing, L. I., N. Y.
Union Iron Wks., Erie, Pa.

EXTRACTORS, PIPE

Chicago Specialty Mfg. Co., Chicago, Ill.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J. (internal wrenches)
Walton Co., Hartford, Conn.

FABRICATED PIPING

See Bends; Headers; etc.

FABRICATORS, PIPE

See Headers, Pipe, Welded; and Coils, Pipe

FAN BALANCING EQUIPMENT

See Equipment, Balancing

FAN BASES

See Bases, Vibration Isolating, Pad Type, and Bases, Vibration Isolating, Spring Type

FAN BLADES

See Blades, Propeller Fan

FAN-COIL UNITS

See Unitary Air Conditioners, Year Around, Fan-Coil Type

FAN CONTROLS

See Controls, Fan

FAN HOUSINGS

See Housing, Fan, Centrifugal

FANS, AXIAL FLOW, PRESSURE TYPE

Acme Engineering & Mfg. Corp., Muskogee, Okla. (tubeaxial)

Aerovent Fan Co., Inc., Piqua, O. (Tubeaxial and vaneaxial)
Alloy Propeller, Zelionople, Pa. (Tubeaxial)
American-Standard Industrial Div., Detroit, Mich. (tubeaxial and vaneaxial)
Bahnson Co., Winston-Salem, N. C. (Vaneaxial)
Bertram Co., Harvey P., The, Cincinnati, O.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Chelsea Fan & Blower Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill. (tubeaxial and vaneaxial)
Cincinnati Fan & Ventilating Co., Cincinnati, O. (tubeaxial)
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif. (tubeaxial and vaneaxial)
Electric Boat Co., Groton, Conn. (vaneaxial)
Hartzell Propeller Fan Co., Piqua, O. (tubeaxial and vaneaxial)
Ilg Electric Ventilating Co., Chicago, Ill. (tubeaxial)
Industrial Plastic Fabricators, Norwood, Mass. (PVC) (tubeaxial)
International Engineering Inc., Dayton, O.
Joy Mfg. Co., Pittsburgh, Pa. (vaneaxial)
Kody Blower Co., Trenton, N. J. (tubeaxial and vaneaxial)
Lennox Industries Inc., Des Moines, Ia. (tubeaxial)
Lennox Industries Inc., Marshalltown, Ia. (vaneaxial)
M & E Mfg. Co., Indianapolis, Ind. (tubeaxial)
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif. (tubeaxial & vaneaxial)
Moore Co., The, Marceline, Mo. (vaneaxial)
Penn Ventilator Co., Philadelphia, Pa. (tubeaxial)
Pesco Products Div., Borg-Warner Corp., Bedford, O.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Propellair Div., Robbins & Myers, Inc., Springfield, O. (tubeaxial and vaneaxial)
Reed Unit-Fans, Inc., New Orleans, La. (tubeaxial)
Robinson Ventilating Co., Zelienople, Pa. (tubeaxial)
South Bend Air Products, Inc., South Bend, Ind.
Stanat Mfg. Co., Inc., Westbury, N. Y. (vaneaxial—2 to 6 in. diameter)
Standard Electric Mfg. Co., West Berlin, N. J. (tubeaxial)
Trade-Wind Div., Robbins & Myers, Inc., Pico Rivera, Calif.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J. (vaneaxial)

FANS, CENTRIFUGAL

Air Conditioning Engineering Co., Cambridge, Mass.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airfan Engineering Co., Los Angeles, Calif.
Airwasher Corp., Eaton Rapids, Mich.
Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Alloy Propeller, Zelionople, Pa. (Stainless Steel)
American Agile Corp., Bedford, O.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Ia.
American-Standard Industrial Div., Detroit, Mich.
Ammerman Co., Inc., Stillwater, Minn.
Arden Airflo Engineering, Inc., El Monte, Calif.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Cardwell Machine Co., Richmond, Va.
Carling Turbine Blower Co., Worcester, Mass.
Carolina Blower Co., Inc., Greensboro, N. C. (shaving exhauster)
Carrier Corp., Syracuse, N. Y.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercialaire Corp. of America, Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Day Co., The, Minneapolis, Minn.
Dayton Electric Mfg. Co., Chicago, Ill.
Donaldson Power Ventilator Co., Los Angeles, Calif.
Dryer Electric Corp., Fan Div., Brooklyn, N. Y.
Duriron Co., Inc., Dayton, O. (Acid resisting)
DuVerre, Inc., Buffalo, N. Y. (plastic)
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Engwald Corp., The, Inwood, Long Island, N. Y.
Fedders Corp., Buffalo, N. Y.
Frigid, Inc., Brooklyn, N. Y.
Gaffers & Sattler, Los Angeles, Calif.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Niles, Mich.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
General Blower Co., Philadelphia, Pa.
General Ceramics Corp., Keasbey, N. J. (ceramics, plastic)
Green Fuel Economizer Co., Inc., The, Beacon, N. Y.
Hamilton Fan & Blower Co., Inc., Cincinnati, O.
Hartzell Propeller Fan Co., Piqua, O.
Heil Process Equipment Corp., Cleveland, O. (plastic and coated solid plastic, and rubber lined)
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
IMC Magnetics Corp., Westbury, Long Island, N. Y.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Jan-Air, Inc., Richmond, Ill.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Joy Mfg. Co., Pittsburgh, Pa.
Kice Metal Products Co., Wichita, Kans.
Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Div., Fuller Co., Catasauqua, Pa.
Lennox Industries Inc., Marshalltown, Ia.
Magic Aire Div., United Electric Co., Wichita Falls, Tex.
Marlo Coil Co., St. Louis, Mo.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Morrison Products, Inc., Cleveland, O.
Mountain States Equipment Co., Denver, Colo.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Northern Blower Co., Cleveland, O.
Phelps Mfg. Co., Little Rock, Ark.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Engineering Corp., Mingo Jct., O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
R & R Metal Products, Inc., Chicago, Ill.
Redmond Co., Inc., Owosso, Mich.
Reliable Products Mfg. Co., Inc., Brooklyn.
Reynolds Mfg. Co., The, Comstock Park, Mich.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., Middletown, Conn. (for cooling aircraft and electronic equipment)
Robinson Ventilating Co., Zelienople, Pa.
Small Motors, Inc., Chicago, Ill. (small sizes)
Sutton Mfg. Co., Norfolk, Va.
Torrington Mfg. Co., The, Torrington, Conn.
Trade-Wind Div., Robbins & Myers, Inc., Pico Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Delaware, O.
Universal Electric Co., Owosso, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

FANS, MATERIALS HANDLING

Air Conditioning Engineering Co., Cambridge, Mass.
Airfan Engineering Co., Los Angeles, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American-Standard Industrial Div., Detroit, Mich.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Cardwell Machine Co., Richmond, Va.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Detroit Blower Corp., Franklin Park, Ill.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Garden City Fan Co., Niles, Mich.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
Kice Metal Products Co., Wichita, Kans.
Kody Blower Co., Trenton, N. J.
Lehigh Fan & Blower Div., Fuller Co., Catasauqua, Pa.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Mountain States Equipment Co., Denver, Colo.
Newcomb-Detroit Co., Detroit, Mich.
New York Blower Co., Chicago, Ill.
Phelps Mfg. Co., Little Rock, Ark.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Engineering Corp., Mingo Jct., O.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Quickdraft Corp., Canton, O.
Robinson Ventilating Co., Zelienople, Pa.
Sprout, Waldron & Co., Inc., Muncy, Pa.

FANS, MECHANICAL DRAFT, FOR BOILERS

Allen Cooler & Ventilator, Inc., Rochester, Mich.
American-Standard Industrial Div., Detroit, Mich.
Ammerman Co., Inc., Stillwater, Minn.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Bertram Co., Harvey P., The, Cincinnati, O.
Bressler Engineering Service, Oregon, Ill.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Dryer Electric Corp., Fan Div., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Niles, Mich.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
General Blower Co., Philadelphia, Pa.
Green Fuel Economizer Co., Inc., The, Beacon, N. Y.

Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Kol-Master Corp., Oregon, Ill.
Lehigh Fan & Blower Div., Fuller Co., Catasauqua, Pa. (induced)
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
McLarty Systems, Battle Creek, Mich.
OverHead Heaters, Inc., Detroit, Mich.
Pacific Steel Boiler Div., National-U.S. Radiator Corp., Johnstown, Pa.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Plant Equipment Div., General Blower Co., Inc., Philadelphia, Pa.
Power Engineering Corp., Mingo Jct., O.
Quickdraft Co., Canton, O.
Reliable Products Mfg. Co., Inc., Brooklyn, N. Y.
Robinson Ventilating Co., Zelienople, Pa.
Tjernlund Mfg. Co., St. Paul, Minn.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

FANS, PROPELLER

Acme Engineering & Mfg. Corp., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
Alloy Propeller, Zelienople, Pa. (Stainless Steel)
American Coolair Corp., Jacksonville, Fla.
American-Standard Industrial Div., Detroit, Mich.
Ammerman Co., Inc., Stillwater, Minn.
Arden Airoflo Engineering, Inc., El Monte, Calif.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Belco Industries, Inc., St. Louis, Mo.
Bertram Co., Harvey P., The, Cincinnati, O.
Broan Mfg. Co., Inc., Hartford, Wis.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercialaire Corp. of America, Brooklyn, N. Y.
Consolidated General Products, Inc., Houston, Tex.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Dayton Electric Mfg. Co., Chicago, Ill.
De Bothezat Fans Div., American Machines and Metals, Inc., New York, N. Y.
Degree Corp., Kansas City, Kans.
Detroit Blower Corp., Franklin Park, Ill.
DeVilbiss Co., The, Toledo, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Donaldson Power Ventilator Co., Los Angeles, Calif.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co. The, Omaha, Nebr.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Hamilton Fan & Blower Co., Inc., Cincinnati, O.
Hartzell Propeller Fan Co., Piqua, O.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
IMC Magnetics Corp., Westbury, Long Island, N. Y.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kody Blower Co., Trenton, N. J.
Koppers Co., Inc., Aeromaster Fan Dept., Baltimore, Md.
Koppers Company, Inc., Metal Products Div., **Baltimore, Md.**
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Lau Blower Co., Dayton, O.
M & E Mfg. Co., Indianapolis, Ind.
Magic Aire Div., United Electric Co., Wichita Falls, Tex.
Main Cornice Works, Inc., Los Angeles, Calif.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
McLarty Systems, Battle Creek, Mich.
Meier Electric, Indianapolis, Ind.
Moore Co., The, Marceline, Mo.
Morrill Motors, Ft. Wayne, Ind.
Mountain States Equipment Co., Denver.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
New York Blower Co., Chicago, Ill.
Norky Mfg. Co., Covington, Ky.
Palmer Fan Div., Palmer Engineering Co., Green Bay, Wis.
Perkins & Son, Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Porter Co., Inc., H. K., Peerless Electric Co., Warren, O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Precision Fan Blade Mfg. Co., Div. of Warrington Co., Los Angeles, Calif.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Co., River Grove, Ill.
Robinson Ventilating Co., Zelienople, Pa.
Romla Co., Los Angeles, Calif.
Schwitzer Corp., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Sutton Corp., O. A., The, Wichita, Kan.
Swift Mfg. Co., Inc., Detroit, Mich.
Torrington Mfg. Co., The, Torrington, Conn.
Trane Co., The, LaCrosse, Wis.
Truflo Fan Co., Harmony, Pa.
Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Western Engineering & Mfg. Co., Los Angeles, Calif.
Westinghouse Electric Corp., Electric Appliance Divisions, Columbus, O.
Whirlwind Mfg. Co., Houston, Tex.
Wind-Way Fan & Ventilating Co., New Orleans, La.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

FASTENERS, INSULATION

Acme Steel Co., Chicago, Ill (steel strapping)
Bostitch, East Greenwich, R. I.
Carr Fastener Co., Div. of United Carr Fastener Corp., Cambridge, Mass.
Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y.
Gerrard & Co., A. J., Melrose Park, Ill.
Gregory Industries, Inc., Bulldog Div., Lorain, O.
Hilti Rapid Fastening Systems, Inc., Stamford, Conn.
Holub Industries, Inc., Sycamore, Ill.
KSM Products, Inc., Merchantville, N. J.
Lexsuco, Inc., Solon, O.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., St. Paul, Minn.
Miracle Adhesives Corp., Bellmore, N. Y.
Moore, Inc., Goodloe E., Danville, Ill.
Omark Industries, Inc., Portland, Ore.
Phillips Drill Co., Michigan City, Ind.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn. (powder-actuated)
Remington Arms Co., Inc., Bridgeport, Conn.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Taft-Jenkins Co., Inc., Holyoke, Mass.
Tinnerman Corp., George A., Cleveland, O.

FASTENERS, POWDER OPERATED

Ammo Products, Inc., Washington, D. C.
du Pont de Nemours & Co., E. I., Wilmington, Del. (chemical expansion blind rivets)
Hilti Rapid Fastening Systems, Inc., Stamford, Conn.
KSM Products, Inc., Merchantville, N. J.
Omark Industries, Inc., Portland, Ore.
Mine Safety Appliances Co., Velocity Power Tool Dept., Pittsburgh, Pa.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn.
Remington Arms Co., Inc., Bridgeport, Conn.
Tempo Products Co., Cleveland, O.

FEEDERS, CHEMICAL, PROPORTIONING

American Meter Co., Pump Div., Philadelphia, Pa.
American Water Softener Co., Philadelphia, Pa.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
B-I-F Industries, Inc., Omega Div., Providence, R. I. (liquid & dry)
B-I-F Industries, Inc., Proportioneers Div., Providence, R. I.
Bruner Corp., Milwaukee, Wis.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.
Clayton Mark & Co., Evanston, Ill.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Graver Water Conditioning Co., New York, N. Y.
Hills-McCanna Co., Chicago, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Jeffrey Mfg. Co., Columbus, O.
Lapp Insulator Co., LeRoy, N. Y.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Myers & Bros. Co., F. E., The, Ashland, O.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Summit, N. J.
Research Appliance Co., Allison Park, Pa.
Smith Chemical Co., E. W., La Puente, Calif.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Stiles Karlsonite Corp., Waukegan, Ill.
Wallace & Tiernan, Inc., Belleville, N. J.

FEEDERS, WATER, HEATING BOILER

Acker Corp., Meridian, Miss.
Bailey Co., Chas. M., San Francisco, Calif.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Campbell Co., J. A., Long Beach, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Morehead Moisture Control, Detroit, Mich.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schaub Engineering Co., Fred H., Chicago.
Smith Chemical Co., E. W., La Puente, Calif.
Squires Co., C. E., The, Cleveland, O.
Watts Regulator Co., Lawrence, Mass.

FEEDWATER HEATERS

See Deaerators

FIBERS FOR AIR FILTERS
American Felt Co., Glenville, Conn.
American Viscose Corp., New York, N. Y.
Celanese Corp. of America, Charlotte, N. C.
Chicopee Mills, Inc., New York, N. Y.
Eastman Chemical Products, Inc., Subsid., Eastman Kodak Co., Kingsport, Tenn.
Microtron Corp., Charlotte, N. C.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plummer Mfg. Co., W. A., Los Angeles, Calif.
Scott Paper Co., Chester, Pa.

FIBER PACKING
See Packing, Fiber

FIBER PIPE
See Pipe, Fiber

FILTER AIR FIBERS
See Fibers for Air Filters

FILTER FRAMES
See Frames for Holding Panel Type Air Filters

FILTER GAGES
See Gages, Air Filter

FILTER OILS
See Oils, for Coating Viscous Air Filters

FILTERS, AIR, AUTOMATIC, DRY
American Air Filter Co., Inc., Louisville, Ky.
Continental Air Filters, Inc., Louisville, Ky.
Day Co., The, Minneapolis, Minn.
Ducon Co., Inc., The, Mineola, N. Y.
Farr Co., Los Angeles, Calif.
Flanders Filters, Inc., Riverhead, Long Island, N. Y.
Gray Co., Inc., Minneapolis, Minn.
Green Fuel Economizer Co., Inc., The, Beacon, N. Y.
Hanna Engineering Works, Chicago, Ill.
Microtron Corp., Charlotte, N. C.
Trion, Inc., McKees Rocks, Pa.
Wheelabrator Corp., Mishawaka, Ind.

FILTERS, AIR, AUTOMATIC, VISCOUS
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Burnett, Jr., Inc., J. F., Rochester, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Farr Co., Los Angeles, Calif.
Radex Corp., Chicago, Ill.

FILTERS, AIR, ELECTRICAL
See Filters, Air, Electrostatic (with outside power source)

FILTERS, AIR, ELECTROSTATIC
(with outside power source)

Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Dollinger Corp., Rochester N. Y.
Electro-air Cleaner Co., Inc., McKees Rocks, Pa.
General Electric Co., Air Conditioning Dept., Tyler, Tex. (up to 2000 cfm)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Radex Corp., Chicago, Ill.
Trion, Inc., McKees Rocks, Pa.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

FILTERS, AIR, GREASE
Specifically designed for kitchen exhaust systems

Air-Con Filter Corp., Memphis, Tenn.
Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The George, Moline, Ill.
Extraer, Inc., Houston, Tex.
Farr Co., Los Angeles, Calif.
Morrison Products, Inc., Cleveland, O.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill. (Aluminum)
Trion Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

FILTERS, AIR, HIGH TEMPERATURE
(For use in filtering air at temperatures of 1000 F and above)

Cambridge Filter Corp., Syracuse, N.Y.
Continental Air Filters, Inc., Louisville, Ky.
Farr Co., Los Angeles, Calif.
Flanders Filters, Inc., Riverhead, Long Island, N. Y.
Mine Safety Appliances Co., Pittsburgh, Pa.

FILTERS, AIR, MANUAL, DRY
American Air Filter Co., Inc., Louisville, Ky.
Continental Air Filters, Inc., Louisville, Ky.

FILTERS, AIR, PANEL, DRY
Air-Con Filter Corp., Memphis, Tenn.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Arco Mfg. Co., New York, N. Y.
Buckeye Mfg., Inc., Columbus, O.
Cambridge Filter Corp., Syracuse, N. Y.
Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Continental Air Filters, Inc., Louisville, Ky.
Coppus Engineering Corp., Worcester, Mass.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Drico Industrial Corp., Passaic, N. J.
Farr Co., Los Angeles, Calif.
Filt-R-Ite Co., Chicago, Ill.
Foamade Industries, Oak Park, Mich.
Hadley Products Co., Inc., Marietta, O.
Master Products Co., Chicago, Ill.
Microtron Corp., Charlotte, N. C.
Peden Equipment Co., Houston, Texas
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Pollen Ex Co., Chicago, Ill.
Skuttle Mfg. Co., Milford, Mich.
Somers Corp., Detroit, Mich.
Star Woolen Co., Cohoes, N.Y.
Viking Air Products Div., National-U. S. Radiator Corp., Cleveland, O.

FILTERS, AIR, PANEL, DRY, COMBINED WITH ACTIVATED CHARCOAL FOR ODOR CONTROL
Barnebey-Cheney Co., Columbus, O.
Cambridge Filter Corp., Syracuse, N. Y.
Flanders Filters, Inc., Riverhead, Long Island, N.Y.

FILTERS, AIR, PANEL, DRY, SUBMICRON PARTICULATE
American Air Filter Co., Inc., Louisville, Ky.
Cambridge Filter Co., Syracuse, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Farr Co., Los Angeles, Calif.
Flanders Filters, Inc., Riverhead, Long Island, N.Y.
Mine Safety Appliances Co., Pittsburgh, Pa.

FILTERS, AIR, PANEL WITH PLASTIC MEDIA
Besser Furnace and Air Conditioning Corp., Charlotte, N. C.
Continental Air Filters, Inc., Louisville, Ky.
Donie Engineering Sales Co., Indianapolis.
Duralast Products Corp., New Orleans, La.
Eaton Air Filter Co., Detroit, Mich.
Gelman Instrument Co., Chelsea, Mich.
Goodyear Tire & Rubber Co., Akron, O.
Hadley Products Co., Inc., Marietta, O.
Microtron Corp., Charlotte, N. C.
Permatron Corp., Chicago, Ill.
Plummer Mfg. Co., W. A., Los Angeles, Calif.
Stoddard Industries, Inc., Cudahy, Wis.

FILTERS, AIR, PANEL, VISCOUS
Air-Con Filter Corp., Memphis, Tenn.
Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville.
Associated Mills, Inc., Chicago, Ill.
Besser Furnace and Air Conditioning Corp., Charlotte, N.C.
Continental Air Filters, Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Drico Industrial Corp., Passaic, N. J.
Evans Corp., The George, Moline, Ill.
Extraer, Inc., Houston, Tex.
Farr Co., Los Angeles, Calif.
Fram Corp., Providence, R. I.
Goodyear Tire & Rubber Co., Akron, O.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill. (Aluminum)
Vortox Co., Claremont, Calif.
Wickford Products, Inc., New York, N. Y.

FILTERS, AIR, THROW-AWAY
Airgard Mfg. Co., Chicago, Ill.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
American Rock Wool Corp., Chicago, Ill.
Arco Mfg. Co., New York, N. Y.
Burke & Co., Los Angeles, Calif.
C.L.B. Co., Houston, Tex.
Cambridge Filter Corp., Syracuse, N. Y. (replaceable cartridge)
Cuno Engineering Co., Meriden, Conn.
Drico Industrial Corp., Passaic, N. J.
Eaton Air Filter Co., Detroit, Mich.
Extraer, Inc., Houston, Tex.
Farr Co., Los Angeles, Calif.
Filt-R-Ite Co., Chicago, Ill.
Flanders Filters, Inc., Riverhead, Long Island, N. Y. (special purpose filters)
Kendall Co., Walpole, Mass.
Microtron Corp., Charlotte, N. C.
Mine Safety Appliances Co., Pittsburgh, Pa.
Owens-Corning Fiberglas Corp., New York.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plummer Mfg. Co., W. A., Los Angeles, Calif.
Pollen Ex Co., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Star Woolen Co., Cohoes, N. Y.
Technical Filter Co., Chicago, Ill.

FILTERS FOR OIL BURNERS
Andale Co., Philadelphia, Pa.
Anderson Brass Co., Detroit, Mich.
Barclay, Inc., Robert, Chicago, Ill.
Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Eds-Wil Burner Corp., Chicago, Ill.
Fram Corp., Providence, R. I.
General Filters, Inc., Novi, Mich.
Hauck Mfg. Co., Brooklyn, N. Y.
Hilliard Corp., Elmira, N. Y.
Kraissl Co., Inc., The, Hackensack, N. J.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Morse-Smith-Morse Co., The, Watertown, Mass.
Newark Wire Cloth Co., Newark, N. J.
Norwood Products Co., Div. of A. R. Wood Mfg. Co., Luverne, Minn.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Purolator Products, Inc., Rahway, N. J.
Rega Mfg. Co., Rochester, N. Y.
Sette Products Co., Oakland, Calif.
Sparkler Mfg. Co., Mundelein, Ill.
Unifilter Co., Novi, Mich.
W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Wix Corp., Gastonia, N. C.
Wood Mfg. Co., A. R., Luverne, Minn.

FILTERS, ODOR
See Adsorbers, Odor, for Duct Systems

FILTERS, PIPE LINE
A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Adams Co., Inc., R. P., Buffalo, N. Y.
Airaterra (Roylyn Products), Glendale, Calif.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
American Meter Co., Inc., Philadelphia, Pa.
Andale Co., Philadelphia, Pa.

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Automatic Switch Co., Florham Park, N. J.
Barnstead Still & Fertilizer Co., Boston, Mass.
Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.
CCA Products, Inc., Glendale, Calif.
Commercial Filters Corp., Melrose, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Danielson Mfg. Co., Danielson, Conn.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddington Metal Specialty Co., Eddington, Pa.
Emco Pneumatic Corp., Des Moines, Ia.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fisher Governor Co., Marshalltown, Ia.
Fram Corp., Providence, R. I.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Filters, Inc., Novi, Mich.
Hankison Corp., Canonsburg, Pa.
Harman Equipment Co., Los Angeles, Calif.
Hilliard Corp., Elmira, N. Y.
Kaye & MacDonald, Inc., West Orange N. J.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Micro Metallic Corp., Glen Cove, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Newark Wire Cloth Co., Newark, N. J.
Norgren Co., C. A. Englewood. Colo.
Nugent & Co., Inc., Wm. W., Skokie, Ill.
Patrol Valve Co., The, Cleveland, O.
Porous Plastic Filter Co., Glen Cove, N. Y.
Purolator Products, Inc., Rahway, N. J.
Ronningen-Petter Co., Vicksburg, Mich.
Schroeder Brothers Corp., McKees Rocks, Pa. (hydraulic fluids)
Scientific Instrument Co., Detroit, Mich.
Selas Corp. of America, Dresher, Pa.
Sethco Mfg. Corp., Merrick, N. Y.
Standard Machine & Mfg. Co., St. Louis, Mo.
Trerice Co., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Unifilter Co., Novi, Mich.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Watts Regulator Co., Lawrence, Mass.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Worthington Corp., East Orange, N. J.

FILTERS, REFRIGERANT

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
American-Standard Detroit Controls Div., Detroit, Mich.
Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Hankison Corp., Canonsburg, Pa.
Hannifin Corp., DesPlaines, Ill.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Phillips & Co., H. A., Chicago, Ill.
Porous Plastic Filter Co., Glen Cove, N. Y.
Purolator Products, Inc., Rahway, N. J.
Refrigeration Research, Inc., Brighton, Mich.
Remco, Inc., Zelienople, Pa.
Ronningen-Petter Co., Vicksburg, Mich.
Sealed Unit Parts Co., Inc., New York, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

FILTERS, WATER

Adams Co., Inc., R. P., Buffalo, N. Y.
American Water Softener Co., Philadelphia.
American Well Works, Aurora, Ill.
Andale Co., Philadelphia, Pa.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County) Texas
Barnebey-Cheney Co., Columbus, O.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Bruner Corp., Milwaukee, Wis.
Cochrane Corp., Philadelphia, Pa.
Commercial Filters Corp., Melrose, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Cuno Engneering Corp., Meriden, Conn.
Dearborn Chemical Co., Chicago, Ill.
Dollinger Corp., Rochester, N. Y.
Duro Co., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Elgin Softener Corp., Elgin, Ill.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fram Corp., Providence, R. I.
Gelman Instrument Co., Chelsea, Mich. (for submicron filtration)
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Greer Hydraulics, Inc., Jamaica, N. Y.
Harman Equipment Co., Los Angeles, Calif.
Henry Valve Co., Melrose Park, Ill.
Hilliard Corp., Elmira, N.Y.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Industrial Filter & Pump Co., Cicero, Ill.
Infilco, Inc., Tucson, Ariz.
Kaye & MacDonald, Inc., West Orange, N. J.
Kisco Boiler & Engineering Co., St. Louis.
Layne & Bowler, Inc., Memphis, Tenn.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Micro Metallic Corp., Glen Cove, N. Y.
Miller Mfg. Co., St. Paul, Minn.
Modern Water Equipment Co., Freeport, Ill.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Norwood Associated Engineers, Inc., Springfield, Mass.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Pace Inc., R.M., Indianapolis, Ind.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Porous Plastic Filter Co., Glen Cove, N. Y.
Pudlo Liquid Filters, Inc., New Holstein, Wis.
Purolator Products, Inc., Rahway, N. J.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Reynolds Water Conditioning Co., Detroit, Mich.
Richmond Engineering Co., Richmond, Va.
Ronningen-Petter Co., Vicksburg, Mich.
Scharf Mfg. Co., J. H., Omaha, Nebr.
Selas Corp. of America, Dresher, Pa.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler Mfg. Co., Mundelein, Ill.
Sparkler-Filtrion Corp., North Chicago, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Stover Water Softener Co., St. Charles, Ill.
Tryco Products, Inc., Westfield, Mass.
Uniflow Mfg. Co., Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Worthington Corp., East Orange, N. J.

FINNED TUBING

See Tubing, Finned

FIRE EXTINGUISHING SYSTEMS

See Systems, Fire Extinguishing

FIRE PUMPS

See Pumps, Fire

FIRE VALVES AND VENTILATORS

See Ventilators, Roof, with Fusible Links

FITTINGS, ALUMINUM TUBE

Aeroquip Corp., Jackson, Mich.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
Anderson Metals Corp., Kansas City, Mo.
Crawford Fitting Co., Cleveland, O.
Elkhart Products Corp., Elkhart, Ind.
Flodar Corp., Cleveland, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Swepco Tube Corp., Clifton, N. J.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.

FITTINGS, BLOW PIPE

Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blow Pipe Co., Chicago, Ill. (tapers, tees, elbows, etc.)
Carolina Blower Co., Inc., Greensboro, N. C.
Chicago Metal Mfg. Co., Chicago, Ill.
Day Co., The, Minneapolis, Minn.
DeVilbiss Metal Fabricators Co., Detroit, Mich.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Kice Metal Products Co., Wichita, Kans.
Kirk & Blum Mfg. Co., Cincinnati, O.
Newcomb-Detroit Co., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research Vacuum Supply Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Torit Mfg. Co., St. Paul, Minn.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Wer-Coy Fabrication Co., Detroit, Mich.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O.

FITTINGS AND BUSHINGS, FUEL OIL TANK; ALARMS, LIQUID LEVEL

Anderson Metals Corp., Kansas City, Mo.
Barclay, Inc., Robert, Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
OPW-Jordan, Cincinnati, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Scully Signal Co., Melrose, Mass.
Spanco Brass Sales, Allegan, Mich.
U. S. Plug & Fitting Co., Wellington, O.
Ward Foundries, Inc., J. P., Blossburg, Pa.

FITTINGS FOR CENTRAL VACUUM CLEANING SYSTEMS

H-P Products, Inc., Louisville, O.
Spencer Turbine Co., Hartford, Conn.

FITTINGS, COPPER TUBE, COMPRESSION

Acheson Mfg. Co., Rankin, Pa.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Arbest Mfg. Co., Philadelphia, Pa.
Baker & Co., R. H., Los Angeles, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Eagle Copper Products Co., Inc., Brooklyn, N. Y.
Elkhart Products Corp., Elkhart, Ind.
Flodar Corp., Cleveland, O.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.

Mueller Brass Co., Port Huron, Mich.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Sall Bros. Co., Rockford, Ill.
Scovill Mfg. Co., Waterbury, Conn.
Spanco Brass Sales, Allegan, Mich.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, COPPER TUBE, FLARED

Acheson Mfg. Co., Rankin, Pa.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Eagle Copper Products Co., Inc., Brooklyn, N. Y.
Elkhart Products Corp., Elkhart, Ind.
Flodar Corp., Cleveland, O.
Gardiner Metal Co., Chicago, Ill.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Phoenix Brass Fittings Corp., Irvington, N. J.
Piper Industries, Inc., Roseville, Mich.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterbury, Conn.
Spanco Brass Sales, Allegan, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, COPPER TUBE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Eagle Copper Products Co., Inc., Brooklyn, N. Y.
Elkhart Products Corp., Elkhart, Ind.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Gardiner Metal Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I.
Gerry Tool Co., Bristol, Conn.
Grabler Mfg. Co., Cleveland, O.
Hubbell Corp., Mundelein, Ill.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Spanco Brass Sales, Allegan, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y. (silver brazed)

FITTINGS, DRAINAGE, FIXED AIR BREAK

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Crane Co., Chicago, Ill.
Zurn Industries, Inc., Erie, Pa.

FITTINGS, EXHAUST, GARAGE, FOR ATTACHING CAR EXHAUST PIPE

Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Ammerman Co., Inc., Stillwater, Minn.
Engwald Corp., The, Inwood, Long Island, N. Y.
Kent-Moore Organization, Inc., Warren, Mich.
National System of Garage Ventilation, Inc., Decatur, Ill.
Wendt Co., O. A., Chicago, Ill.

FITTINGS, HOSE TO PIPE

Acheson Mfg. Co., Rankin, Pa.
Aeroquip Corp., Jackson, Mich.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
Allen Mfg. Co., W. D., Bellwood, Ill.
American Sanitary Mfg. Co., Abingdon, Ill. (for polyethylene plastic tubing)
Anchor Coupling Co. Inc., Libertyville, Ill.
Anderson Brass Co., Detroit, Mich.
Band-It Co., Denver, Colo.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Dole Refrigerating Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Hewitt-Robbins, Inc., Stamford, Conn.
Hose Accessories Co., Philadelphia, Pa.
Jaco Mfg. Co., Cleveland, O. (nylon compression tube fitting)
Lenz Co., Dayton, O.
OPW-Jordan, Cincinnati, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Piper Industries, Inc., Roseville, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spanco Brass Sales, Allegan, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, HOT WATER HEATING SYSTEMS, ONE PIPE

American Tube Products, Inc., West Warwick, R. I.
Autostributor Co., Lansing, Mich. (manifold for connecting radiator branches)
Bell & Gossett Co., Morton Grove, Ill.
Bernstrom, Inc., C. R., Providence, R. I.
Dunham-Bush, Inc., West Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Mel Products Co., The, East Haven, Conn.
Panel Heat, Inc., Copiague, N. Y.
Piper Industries, Inc., Roseville, Mich.
Sall Bros. Co., Rockford, Ill.
Spanco Brass Sales, Allegan, Mich.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.

FITTINGS, LIFT

Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, LINED

American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber)
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Lead and tin)
Division Lead Co., Summit, Ill. (lead)
Gates Engineering Co., Wilmington, Del.
General Ceramics Corp., Keasbey, N. J. (ceramics & graphite)
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
Knapp Mills, Inc., Long Island City, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin)
Luzerne Rubber Co., Trenton, N. J. (hard rubber)
Marquette Coppersmithing Co., Philadelphia.
Michigan Pipe Co., Ferndale, Mich. (Wood, saraloy)
National Lead Co., New York, N. Y. (Lead)
Nazar Rubber Co., Toledo, O.
Nibco, Inc., Elkhart, Ind. (Tinned)
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (lead)
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y. (cement)
United States Rubber Co., New York, N. Y. (Rubber)

FITTINGS, PIPE, ALUMINUM

Airaterra (Roylyn Products), Glendale, Calif.
Aluminum Co. of America, Pittsburgh, Pa.
American Flow Control Corp., Houston, Tex.
Bonney Forge & Tool Wks., Allentown, Pa.
Chemiquip Co., New York, N. Y.
Clayton Mark & Co., Evanston, Ill.
Flowline Corp., New Castle, Pa.
General Aluminum Supply Co., Kansas City, Mo.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ladish Co., Cudahy, Wis.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
OPW-Jordan, Cincinnati, O.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky. (welding)
Victaulic Co. of America, Elizabeth, N. J.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, BRASS, THREADED

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
American Manganese Bronze Co., Philadelphia, Pa.
American Sanitary Mfg. Co., Abingdon, Ill.
Anchor Coupling Co. Inc., Libertyville, Ill.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Baker & Co., R. H., Los Angeles, Calif.
Bonney Forge & Tool Wks., Allentown, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Chemiquip Co., New York, N. Y.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Flodar Corp., Cleveland, O.
Gilbert Brass Foundry Co., St. Louis, Mo.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Imperial Brass Mfg. Co., Chicago, Ill.
Ken-Ray Brass Products, Inc., Vermont, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Leavitt Machine Co., Orange, Mass.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
New York Brass Fdry., New York, N. Y.
OPW-Jordan, Cincinnati, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Spanco Brass Sales, Allegan, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y. (Brazed)
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, PIPE, BRASS, WELDING

Airaterra (Roylyn Products), Glendale, Calif.
Bonney Forge & Tool Wks., Allentown, Pa.

Chase Brass & Copper Co., Waterbury, Conn.
Clayton Mark & Co., Evanston, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Spanco Brass Sales, Allegan, Mich.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.

FITTINGS, PIPE, BRONZE, BRAZED

Acheson Mfg. Co., Rankin, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, BRONZE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Panel Heat, Inc., Copiague, N. Y.
Phoenix Brass Fittings Corp., Irvington, N. J.
Union Metal Works Co., Inc., Chelsea, Mass.

FITTINGS, PIPE, CAST IRON, FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Frick Co., Waynesboro, Pa.
Goodall Rubber Co., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Kuhns Bros. Co., Dayton, O.
Lead Lined Iron Pipe Co., Inc., Wakefield, Mass. (Lead lined)
Leavitt Machine Co., Orange, Mass.
Lynchburg Foundry Co., Lynchburg, Va.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Malleable Iron Fittings Co., Branford, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Parks-Cramer Co., Fitchburg, Mass. (Jacketed)
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, CAST IRON, MECHANICAL JOINT

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y.

FITTINGS, PIPE, CAST IRON, THREADED

Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Illinois Malleable Iron Co., Chicago, Ill.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
Newbery Mfg. Co., Inc., Talladega, Ala.
Ravena Iron Co., Ravena, N. Y.
Rich Mfg. Co. of California, Los Angeles, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plug)
Union Malleable Mfg. Co., Ashland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries Inc., J. P., Blossburg, Pa.
Zurn Industries, Inc., Erie, Pa.

FITTINGS, PIPE, COMPRESSION

Anderson Metals Corp., Kansas City, Mo.
Baker & Co., R. H., Los Angeles, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Cooper Alloy Corp., Hillside, N. J.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Guardian Products Corp., Michigan City, Ind.
Hays Mfg. Co., Erie, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Piper Industries, Inc., Roseville, Mich.
Smith-Blair, Inc., S. San Francisco, Calif.
Telsco Fittings Div., Dallas, Tex.
Tru-Seal Div., Flick-Reedy Corp., Bensenville, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, PIPE, FIBER

Brown Co., Boston, Mass.
Central Foundry Co., New York, N. Y.

FITTINGS, PIPE, HARD RUBBER

American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Gates Engineering Co., Wilmington, Del.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Luzerne Rubber Co., Trenton, N. J.
Nazar Rubber Co., Toledo, O.
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

FITTINGS, PIPE, JACKETED

Albert Pipe Supply Co., Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Hetherington & Berner, Inc., Indianapolis, Ind.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parks-Cramer Co., Fitchburg, Mass.
Red Jacket Co., Inc., Carnegie, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, LEAD

Alpha Metals, Inc., Jersey City, N. J.
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., San Francisco, Calif.
Division Lead Co., Summit, Ill.
Flemm Lead Co., Inc., Long Island City, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Knapp Mills, Inc., Long Island City, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Leavitt Machine Co., Orange, Mass.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
National Lead Co., New York, N. Y.
Piper Industries, Inc., Roseville, Mich.
Resisto Pipe & Valve Co., East Cambridge, Mass.
Rochester Lead Works, Inc., Rochester, N. Y.

FITTINGS, PIPE, MALLEABLE

Beaton & Corbin Mfg. Co., Southington, Conn.
Corley Co., Inc., The, Bounton, N. J.
Crane Co., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Fanner Mfg. Co., The, Cleveland, O.
Flagg & Co., Inc., Stanley G., Philadelphia.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Illinois Malleable Iron Co., Chicago, Ill.
James Foundry Corp., Ft. Atkinson, Wis.
Ladish Co., Cudahy, Wis.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Stockham Valves & Fittings, Birmingham.
Telesco Fittings Div., Dallas, Tex.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Malleable Mfg. Co., Ashland, O.
Vitaulic Co. of America, Elizabeth, N. J.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburg, Pa.

FITTINGS, PIPE, NICKEL AND NICKEL ALLOY

American Manganese Bronze Co., Philadelphia, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bonney Forge & Tool Wks., Allentown, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Harrison Steel Corp., Brooklyn, N. Y.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky. (welding)
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, NICKEL PLATED

Acheson Mfg. Co., Rankin, Pa.
Bart Mfg. Corp., Belleville, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.

FITTINGS, PIPE, NYLON

Crescent Plastics, Inc., Evansville, Ind.
Nylon Molding Corp., Garwood, N. J.
Skyline Industries Sales, Inc., Titusville, Pa.
Union Malleable Mfg. Co., Ashland, O.
Wheeling Machine Products Co., Wheeling, W. Va.

FITTINGS, PIPE, PLASTIC

Albert Pipe Supply Co., Inc., Brooklyn, N. Y.
Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Agile Corp., Bedford, O.
American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
American Vulcathene Div. Nalge Co., Inc., Rochester, N. Y. (polyethylene)
Anesite Co., Chicago, Ill.
Argo Plastic Products, Cleveland, O.
Atlas Mineral Products Co., Mertztown, Pa.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Carlon Products Corp., Aurora, O.
Chesflex Div., St. Regis Paper Co., Yonkers, N. Y.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.

Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind.
Danielson Mfg. Co., Danielson, Conn.
Dow Chemical Co., The, Midland, Mich. (saran-lined)
Evanite Plastic Co., Div. of the Evans Pipe Co., Uhrichsville, O.
Fibercast Co., Sand Spring, Okla.
Franklin Plastics, Inc., Franklin, Pa.
General Ceramics Corp., Keasbey, N.J.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC)
Grinnell Co., Inc., Providence, R. I.
Haveg Industries, Inc., Wilmington, Del.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Industrial Plastic Fittings Co., Towson, Md.
Jaco Mfg. Co., Cleveland, O. (nylon compression tube fitting)
Johnson Plastics Corp., Chagrin Falls, O.
Kraloy Plastic Pipe Co., Inc., Los Angeles.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Luzerne Rubber Co., Trenton, N. J.
Mannesmann-Easton Plastic Products Co., Inc., Easton, Pa. (rigid unplasticized polyvinyl chloride)
Manufacturers Corp., Mansfield, O.
Moore & Co., Samuel, Mantua, O. (tubing)
Mueller Brass Co., Port Huron, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Pipeline Coatings & Engineering Co., Los Angeles, Calif.
Plastex Co., Columbus, O.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Protokap, Inc., Houston, Tex. (end caps)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Steel Corp., Cleveland, O.
Robinson Clay Product Co., The, Akron, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
S & C Mfg. Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich. (saran)
Seelye Craftsmen, Inc., Minneapolis, Minn.
Skyline Industries Sales, Inc., Titusville, Pa.
Sloane Mfg. Co., Sun Valley, Calif. (PVC, kralastic, butyrate)
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (unplasticized polyvinyl chloride)
Telsco Fittings Div., Dallas, Tex.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded UPVC, and others)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York.
Vanton Pump & Equipment Corp., Hillside, N. J.
Victaulic Co. of America, Elizabeth, N. J.
Walworth Co., New York, N. Y.
Wheeling Machine Products Co., Wheeling, W. Va.
Yardley Plastics Co., Columbus, O.

FITTINGS, PIPE, SADDLE TEE

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Baker & Co., R. H., Los Angeles, Calif.
Bonney Forge & Tool Wks., Allentown, Pa.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Elkhart Products Corp., Elkhart, Ind.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
O.T.M. Corp., Houston, Tex.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Sall Bros. Co., Rockford, Ill.
Skinner Co., M. B., South Bend, Ind.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky. (welding)

FITTINGS, PIPE, SANITARY

Acheson Mfg. Co., Rankin, Pa.
American Vulcathene Div. Nalge Co., Inc., Rochester, N. Y.
Central Foundry Co., New York, N. Y.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Epco Sales, Inc., Cleveland, O.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Leavitt Machine Co., Orange, Mass.
Mueller Brass Co., Port Huron, Mich.
Robinson Clay Product Co., The, Akron, O.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.

FITTINGS, PIPE, SLIP-ON

Fibercast Co., Sand Spring, Okla.
Henry Valve Co., Melrose Park, Ill.
Hollaender Mfg. Co., Cincinnati, O.
Telsco Fittings Div., Dallas, Tex.

FITTINGS, PIPE, SPECIAL FOR BASEBOARD RADIATION

General Fittings Co., East Greenwich, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Panel Heat, Inc., Copiague, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Union Metal Works Co., Inc., Chelsea, Mass.
Webster & Co., Warren, Camden, N. J.

FITTINGS, PIPE, STAINLESS STEEL

Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Alloy Stainless Products Co., Totowa, N. J.
American Flow Control Corp., Houston, Tex.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Baker & Co., R. H., Los Angeles, Calif.
Bonney Forge & Tool Wks., Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Chemiquip Co., New York, N. Y.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Flodar Corp., Cleveland, O.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Harrison Steel Corp., Brooklyn, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
OPW-Jordan, Cincinnati, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Portland Cooper & Tank Wks., Inc., South Portland, Me.
Pypon Co., Pittsburgh, Pa.
Special Screw Products, Bedford, O.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tru-Seal Div., Flick-Reedy Corp., Bensenville, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Victaulic Co. of America, Elizabeth, N. J.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STAINLESS STEEL, WELDING

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bonney Forge & Tool Wks., Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Flowline Corp., New Castle, Pa.
Grinnell Co., Inc., Providence, R. I.
Harrison Steel Corp., Brooklyn, N. Y.
Heat & Power Corp., Baltimore, Md.
Ladish Co., Cudahy, Wis.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Midwest Piping Co., Inc., St. Louis, Mo.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Portland Copper & Tank Works, Inc., South Portland, Me.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STEEL, FLANGED

Alco Products, Inc., Schenectady, N. Y.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
Gray Tool Co., Houston, Tex.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lead Lined Iron Pipe Co., Inc., Wakefield, Mass. (Lead lined)
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pipe Line Development Co., Cleveland, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engrg Div., Allied Chemical Corp., New York, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, FORGED, THREADED

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Meter Co., Inc., Philadelphia, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Clayton Mark & Co., Evanston, Ill.
Crane Co., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif. (pipe plug)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Wheeling Machine Products Co., Wheeling, W. Va.

FITTINGS, PIPE, STEEL, SOCKET WELD

Alpha Plastics, Inc., Livingston, N. J. (PVC)
Bonney Forge & Tool Works, Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Harrison Steel Corp., Brooklyn, N. Y.
Henry Valve Co., Melrose Park, Ill.

Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Special Screw Products, Bedford, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, THREADED

Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Bonney Forge & Tool Works, Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Crane Co., Chicago, Ill.
Fine Products Co., Berwyn, Ill.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Lenz Co., Dayton, O.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Tru-Seal Div., Flick-Reedy Corp., Bensenville, Ill.
Tubing Seal-Cap, Inc., San Gabriel, Calif. (plugs and caps)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Wheeling Machine Products Co., Wheeling, W. Va.

FITTINGS, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Bonney Forge & Tool Works, Allentown, Pa.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Heat & Power Corp., Baltimore, Md.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Jackson-Markus Supply Co., Los Angeles, Calif.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
O. T. M. Corp., Houston, Tex.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pipe Line Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STEEL, WELDING, SEAMLESS

Babcock & Wilcox., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Nibco, Inc., Elkhart, Ind.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
O.T.M. Corp., Houston, Tex.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Special Screw Products, Bedford, O.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, VITRIFIED CLAY

American Vitrified Products Co., Cleveland.
National Clay Pipe Mfg. Inc., Washington, D. C.
Robinson Clay Products Co., The, Akron, O.
Straitsville Brick Co., New Straitsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Universal Sewer Pipe Corp., Cleveland, O.

FITTINGS, PIPE, WROUGHT IRON, WELDING

Albert Pipe Supply Co., Inc., Brooklyn, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Byers Co., A. M., Pittsburgh, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo..
National Valve & Mfg. Co., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, REFRIGERATION

Aeroquip, Inc., Van Wert, O.
American Brass Co., Waterbury, Conn.
Anderson Metals Corp., Kansas City, Mo.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago.
Elkhart Products Corp., Elkhart, Ind.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Piper Industries, Inc., Roseville, Mich.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Remco, Inc., Zelienople, Pa.
Spanco Brass Sales, Allegan, Mich.
Superior Valve & Fittings Co., Pittsburgh.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, STEEL TUBE, FLARED

Aeroquip, Inc., Van Wert, O.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
Couplings Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
H-P Products, Inc., Louisville, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Lenz Co., Dayton, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Piper Industries, Inc., Roseville, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Special Screw Products, Bedford, O.
Swepco Tube Corp., Clifton, N. J.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, STEEL TUBE, FLARELESS

Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
American Flow Control Corp., Houston, Tex.
Chicago Forging and Mfg. Co., Chicago, Ill.
Crawford Fitting Co., Cleveland, O.
Flodar Corp., Cleveland, O.
H-P Products, Inc., Louisville, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Lenz Co., Dayton, O.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Special Screw Products, Bedford, O.
Swepco Tube Corp., Clifton, N. J.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Youngstown Welding & Engineering Co., Youngstown, O.

FLAME CONTROLS

See Controls, Flame Failure

FLAME CUTTERS

See Cutters, Flame

FLAME DETECTORS

See Systems, Combustion Control

FLANGE BOLTS

See Bolts and Studs, Flange

FLANGE COVERS

See Covers, Protective, Valve and Flange

FLANGE LINE-UP

See Pins, for Flange Line-Up

FLANGE SEPARATORS

See Separators, Flange

FLANGES, ORIFICE

American Meter Co., Inc., Philadelphia, Pa.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Grinnell Co., Inc., Providence, R. I.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Ladish Co., Cudahy, Wis.
Madden Corp., The, Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Brass Foundry, New York, N. Y. (brass)
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
O. T. M. Corp., Houston, Tex.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Catasauqua, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trimount Instrument Co., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, LAP JOINT

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, SCREWED

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Camco Fittings, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flowline Corp., New Castle, Pa.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, WELDING

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALUMINUM, WELDING

Flowline Corp., New Castle, Pa.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.

FLANGES, PIPE, BRASS, SCREWED

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Providence, R. I.
Ladish Co., Cudahy, Wis.
National Valve & Mfg. Co., Pittsburgh, Pa.
New York Brass Foundry, New York, N. Y.
Nibco, Inc., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Ritter Pattern & Casting Co., New York, N. Y.
Spanco Brass Sales, Allegan, Mich.
Taylor Forge & Pipe Works, Chicago, Ill.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.

FLANGES, PIPE, CAST IRON, SCREWED

Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Fanner Mfg. Co., The, Cleveland, O.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
G. & H Mfg. Co., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Kuhns Bros. Co., Dayton, O.
Lynchburg Foundry Co., Lynchburg, Va.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
National Valve & Mfg. Co., Pittsburgh, Pa.
OPW-Jordan, Cincinnati, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Ravena Iron Co., Ravena, N. Y.
Ritter Pattern & Casting Co., New York, N. Y.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburg, Pa.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

FLANGES, PIPE, MALLEABLE IRON, SCREWED

Crane Co., Chicago, Ill.
Fanner Mfg. Co., The, Cleveland, O.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jefferson Union Co., Lexington, Mass.
Ladish Co., Cudahy, Wis.
National Valve & Mfg. Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

FLANGES, PIPE, NICKEL AND NICKEL ALLOY

Bart Mfg. Corp., Belleville, N. J.
Camco Fittings, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Harrison Steel Corp., Brooklyn, N. Y.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia.
Midwest Piping Co., Inc., St. Louis, Mo.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Speedline Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Star Stainless Screw Co., Paterson, N. J.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, PLASTIC

American Vulcathene Div. Nalge Co., Inc., Rochester, N. Y. (polyethylene)
Argo Plastic Products, Cleveland, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Commercial Plastic Co., Chicago, Ill.
Dow Chemical Co., The, Midland, Mich. (saran-lined)
Fibercast Co., Sand Spring, Okla.
Grinnell Co., Inc., Providence, R. I.
Haveg Industries, Inc., Wilmington, Del.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Luzerne Rubber Co., Trenton, N. J.
Mannesmann-Easton Plastic Products Co., Inc., Easton, Pa. (rigid unplasticized polyvinyl chloride)
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles.
Skyline Industries Sales, Inc., Titusville, Pa.
Sloane Mfg. Co., Sun Valley, Calif.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (UPVC)
Vanton Pump & Equipment Corp., Hillside, N. J.

FLANGES, PIPE, STEEL, FORGED

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
O. T. M. Corp., Houston, Tex.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Catasauqua, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, LAP JOINT

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Flowline Corp., New Castle, Pa.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Ladish Co., Cudahy, Wis.

Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
O.T.M. Corp., Houston, Tex.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Swepco Tube Corp., Clifton, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, SCREWED
Babcock & Wilcox Co., The, Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
O.T.M. Corp., Houston, Tex.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
U. S. Plug & Fitting Co., Wellington, O.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, WELDING
Alco Products, Inc., Schenectady, N. Y.
Allegheny Valve Co., Warren, Pa.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Fittings, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Co., Div. of Harsco Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
O.T.M. Corp., Houston, Tex.
Pennsylvania Forge Div. of Chemetron Corp., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Catasauqua, Pa.
Pipe Line Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Forgings of America, Inc., Portland, Ore.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLARED FITTINGS, COPPER TUBE
See Fittings, Copper, Tube, Flared

FLARED FITTINGS, STEEL TUBE
See Fittings, Steel Tube, Flared

FLARING TOOLS FOR TUBING
See Tools, Flaring

FLEXIBLE COUPLINGS
See Couplings, Flexible

FLEXIBLE DUCT CONNECTIONS
See Connections, Duct, Flexible

FLEXIBLE DUCTS
See Ducts and Duct Fittings, Prefabricated, Flexible, Metallic and Non-Metallic

FLEXIBLE METAL HOSE
See Hose, Flexible, Metal and Fittings

FLOAT SWITCHES
See Switches, Float

FLOAT VALVES
See Valves, Float

FLOATS, STEAM TRAP, ETC.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Chicago Float Works, Not Inc., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Defender Instrument & Regulator Co., Boody, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Harris & Co., Arthur, Chicago, Ill. (all metals)
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
McAlear Mfg. Co., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Owens & Co., Inc., Henry, Cranston, R. I.
Reichert Float & Mfg. Co., Toledo, O.
Sarco Co., Inc., New York, N. Y.
Sterling Engineering Mfg. Corp., Hyde Park, Mass.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Watson & McDaniel Co., Philadelphia, Pa.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

FLOOR AND CEILING PLATES
See Plates, Floor and Ceiling

FLOW ALARMS
See Alarms, High and Low Flow for Piping Systems

FLOW CONTROL VALVES
See Valves, Flow Control

FLOW MEASURING NOZZLES AND TUBES
See Nozzles, Flow Measuring

FLOW METERS
See Meters, Flow

FLOW SWITCHES
See Switches, Flow

FLOW TRANSMITTERS
See Transmitters, Flow

FLUE SPILLAGE SWITCH
See Switches, Flue Spillage, for Shutting Off Gas Burner

FLUXES
See Solders and Fluxes

FORGED STEEL VALVES
See Valves, Forged Steel

FRAMES, AIR INLET, PREFABRICATED, FOR AIR CONDITIONING UNITS
Courier Associates, Inc., New York, N. Y.
Lewis Mfg. Co., Inc., Miami, Fla.

FRAMES FOR HOLDING PANEL TYPE AIR FILTERS
Air Devices, Inc., New York, N. Y.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Courier Associates, Inc., New York, N. Y.
Evans Corp., The George, Moline, Ill.
Extraer, Inc., Houston, Tex.
Temtrol, Inc., Okarche, Okla.

FRESHENERS, AIR
See Adsorbers, Odor, for Duct Systems; Compounds, Air Freshening

FUEL ECONOMIZERS
See Economizers, Fuel

FUEL OIL LEAK DETECTORS
See Detectors, Leak, Fuel Oil

FUEL OIL METERING VALVES
See Valves, Fuel Oil, Metering

FUEL OIL UNITS
See Units, Fuel Oil, Heating, Pumping and Straining

FURNACES, DUCT
See Heaters, Duct

FURNACES, SUSPENDED
See Heaters, Air, Direct Fired

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING
Exclusively for duct distribution of air—300,000 Btu per hr and over. For direct fired heaters, which may be located in the space heated or may be used in central plant installations with duct distribution of the air, see the listings under Heaters, Air, Direct Fired.

Air Conditioning Engineering Co., Cambridge, Mass.
Air Heaters, Inc., Youngstown, O.
Aladdin Heating Corp., San Leandro, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Arkos Mfg. Co., Detroit, Mich.
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O.
Bard Mfg. Co., Bryan, O.
Besser Furnace and Air Conditioning Corp., Charlotte, N. C.
Bryant Mfg. Co., Indianapolis, Ind.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., St. Paul, Minn.
International Heater Co., Utica, N. Y.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Heater Corp., Chelsea, Mass.
Lee Corporation, Wilmington, Del.
Lennox Industries Inc., Des Moines, Ia.
Lennox Industries Inc., Columbus, O.
Lennox Industries Inc., Marshalltown, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
Mastro-Hoskinson Mfg. Corp., Inc., Franklin Sq., Long Island, N. Y.
McPherson Furnace & Supply Co., Portland, Ore.
Meyer Furnace Co., The, Peoria, Ill.
Montag Inc., Portland, Ore.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Heater Co., Inc., St. Paul Minn.
National-U. S. Radiator Corp., Johnstown, Pa.
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
Patten Co., J. V., Sycamore, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.

Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Reznor Mfg. Co., Mercer, Pa.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Inc., Dowagiac, Mich.
Siebring Mfg. Co., George, Ia.
Surface Combustion Corp., Toledo, O.
Syncromatic Corp., Watertown, Wis.
Tjernlund Mfg. Co., St. Paul, Minn.
Tuck-Aire Furnace Co., San Francisco, Calif
Waterman-Waterbury Co., The, Minneapolis, Minn.
York-Shipley, Inc., York, Pa.

FUSIBLE LINKS
See Links, Fusible

GAGE GLASSES
See Glasses, Gage

GAGE SETS, REFRIGERATION
Airserco Mfg. Co., Pittsburgh, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Warren, Mich.
Shank Co., Cyrus, Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.

GAGE TESTERS
See Testers, Gage, Dead Weight

GAGES, AIR FILTER
Bacharach Industrial Instrument Co., Pittsburgh, Pa. (filter gauge)
Cleveland Controls, Inc., Cleveland, O.
Defender Instrument and Regulator Co., Boody, Ill.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa
Hays Corp., Michigan City, Ind.
Herbusch Corp., The, St. Louis, Mo. (Warning device)
Meriam Instrument Co., The, Cleveland, O.
Mine Safety Appliances Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, DRAFT
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Controls, Inc., Cleveland, O.
Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hill & Co., E. Vernon, Lake Geneva, Wis.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Markesan, Wis.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, PRESSURE
Acme Gauge & Instrument Co., Inc., Brooklyn, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Binks Mfg. Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Controls, Inc., Cleveland, O.
Crosby Valve & Gage Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif. (mechanical)
Dunham-Bush, Inc., West Hartford, Conn.
Dwyer Mfg. Co., F. W., Michigan City, Ind
Eclipse Fuel Engineering Co., Rockford, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Gardner-Denver Co., Quincy, Ill.
General Blower Co., Philadelphia, Pa.
General Controls Co., Glendale, Calif.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Imperial Brass Mfg. Co., Chicago, Ill.
International Register Co., Chicago, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Madden Brass Products Co., Aurora, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Moore Products Co., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norden-Ketay Corp., Instrument & Systems Div., Milford, Conn.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instruments Co., Detroit, Mich.
Shallcross Controls, Inc., Markesan, Wis.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uehling Instrument Co., Paterson, N. J.
United Instrument Co., Brooklyn, N. Y.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Wallace & Tiernan Inc., Belleville, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.

GAGES, INDICATING, VACUUM
Acme Gauge & Instrument Co., Inc., Brooklyn, N. Y.
Airserco Mfg. Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Cleveland Controls, Inc., Cleveland, O.
Crosby Valve & Gage Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hastings-Raydist, Inc., Hampton, Va.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Imperial Brass Mfg. Co., Chicago, Ill.
International Register Co., Chicago, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Madden Brass Products Co., Aurora, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norden-Ketay Corp., Instrument and Systems Div., Milford, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.

GAGES, LIQUID LEVEL
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barclay, Inc., Robert, Chicago, Ill
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fine Products Co., Berwyn, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Hays Corp., Michigan City, Ind.
Henry Valve Co., Melrose Park, Ill.
Infilco, Inc., Tucson, Ariz.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidometer Corp., Long Island City, N. Y.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Mar-Coil Heater Co., Union, N. J.
Meriam Instrument Co., The, Cleveland, O.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norden-Ketay Corp., Instrument and Systems Div., Milford, Conn.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Phillips & Co., H. A., Chicago, Ill.
Powell Co., Wm. Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Republic Mfg. Co., Cleveland, O.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Simplex Valve & Meter Co., Lancaster, Pa.

Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Strahman Valves, Inc., Florham Park, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Texas Instruments, Inc., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (water)
Yarnall-Waring Co., Philadelphia, Pa.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

GAGES, OIL BURNER ELECTRODES

Scully Signal Co., Melrose, Mass.

GAGES, OIL TANK

Applied Mechanics Co., Boston, Mass.
Barclay, Inc., Robert, Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidometer Corp., Long Island City, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mar-Coil Heater Co., Union, N. J.
Meriam Instrument Co., The, Cleveland, O.
Milton Roy Co., Philadelphia, Pa.
Morrison Brothers Co., Dubuque, Ia.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Petrometer Corp., Long Island City, N. Y.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Viking Pump Co., Cedar Falls, Ia.

GAGES, PIPE

A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., Pelham Manor, N. Y. (internal borescope)
Dayton Rogers Mfg. Co., Minneapolis, Minn.
Defender Instrument & Regulator Co., Boody, Ill.
DoAll Co., The, Des Plaines, Ill.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass. (thread)
Greer Hydraulics, Inc., Jamaica, N. Y.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, Evanston, Ill.

GALVANIZED SHEETS

See Sheets, Steel, Galvanized

GALVANNEALED SHEETS

See Sheets, Steel, Galvannealed

GARAGE VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

GAS BURNER FLUE SPILLAGE SWITCH

See Switches, Flue Spillage, for Shutting Off Gas Burner

GAS BURNERS

See Burners, Gas

GAS ENGINES

See Engines, Gas

GAS FIRED RADIATORS

See Radiators, Gas Fired

GAS PRESSURE REGULATORS

See Regulators, Pressure, Gas

GAS VENT AND FLUE PIPE

See Pipe and Fittings, Gas Vent and Flue

GAS VOLUME METERS

See Meters, Volume, Air and Gas

GASKETS

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Akron Metallic Gasket Co., Akron, O.
Allpax Co., Inc., Mamaroneck, N. Y.
Alpha Metals, Inc., Jersey City, N. J.
American Felt Co., Glenville, Conn.
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Anchor Packing Co., Philadelphia, Pa. (As**bestos)**
Andrew Parts Mfg. Co., Long Island City, N. Y.
Armstrong Cork Co., Lancaster, Pa. (Cork & **cork composition)**
Belmont Packing & Rubber Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y. (Lead)
Brady Co., W. H., Milwaukee, Wis.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chase Brass & Copper Co., Waterbury, Conn. (Brass and copper)
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago-Wilcox Mfg. Co., Chicago, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Continental-Diamond Fibre Corp., Newark, Del. (fibre)
Connecticut Hard Rubber Co., New Haven, Conn. (rubber)
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y. (Asbestos)
Division Lead Co., Summit, Ill. (lead)
Durabla Mfg. Co., New York, N. Y. (Asbestos fibre)
Durable Rubber Products, Chicago, Ill. (rubber)
Ernst Water Column & Gauge Co., Livingston, N. J.
Excelsior Leather Washer Mfg. Co., Rockford, Ill. (leather)
Felt Products Mfg. Co., Skokie, Ill.
Felters Company, The, Boston, Mass. (felt)
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
General Tire & Rubber Co., Akron, O.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Shelton, Conn.
Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson, Inc., Chicago, Ill. (asbestos)
Graton & Knight Co., Worcester, Mass. (Leather)
Greene, Tweed & Co., North Wales, Pa.
Hamilton Kent Mfg. Co., Kent, O. (for concrete pipe)
Hewitt-Robins, Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa.
Jarrow Products, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
L M R Engineering Corp., St. Louis, Mo. (plastic grommet where piping passes through panels)
Linear Incorporated, Philadelphia, Pa.
McCord Corp., Detroit, Mich.
Mercer Rubber Co., Hamilton Sq., N. J.
Metallo Gasket Co., New Brunswick, N. J. (Metal, metal asbestos)
Mic-Lin Co., Maple Shade, N. J.
Mortell Co., J. W., Kankakee, Ill.
National Lead Co., New York, N. Y. (lead)
Neff-Perkins Co., Painesville, O.
New York Belting & Packing Co., Passaic, N. J.
Nicolet Industries, Inc., Hamilton, O. (asbestos)
O.T.M. Corp., Houston, Tex.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Seal Co., Culver City, Calif.
Products Research Co., Los Angeles, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J. **(Rubber and asbestos)**
Rhopac, Inc., Skokie, Ill. (all types — non metallic)
Rubatex Div., Great American Industries, Inc., **Bedford, Va.**
Saran Lined Pipe Co., Ferndale, Mich.
Schieren Co., Chas. A., Camden, N. J.
Spring Packing Corp., Chicago, Ill. (adhesive-backed sponge rubber, cork & felt)
Stalwart Rubber Co., The, Bedford, O. (rubber)
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (Hard rubber)
Technical Ply-Woods Sales, Chicago, Ill.
Tube Turns Plastics, Inc., Louisville, Ky. (for UPVC pipe)
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & **Synthetics Div., Akron, O. (plastic)**
Western Felt Wks., Chicago, Ill. (Felt)
Zimmerman Packing, Cincinnati, O. (also gasket cutters)

GASOLINE FIRED HEATERS

See Heaters, Gasoline Fired

GAS VENT AND FLUE PIPE AND FITTINGS

See Pipe and Fittings, Gas Vent and Flue

GATES, BLAST

Allington & Curtis Mfg. Co., Saginaw, Mich.
Berger Bros. Co., Philadelphia, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Industrial Plastic Fabricators, Norwood, Mass. (PVC and polyethylene)
Kirk & Blum Mfg. Co., Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Spencer Turbine Co., Hartford, Conn.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.

GATES, LIFT, FOR TRUCKS

Anthony Company, Streator, Ill.

GEAR-MOTORS

Abart Gear & Machine Co., Chicago, Ill.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Boston Gear Works, Quincy, Mass.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Century Electric Co., St. Louis, Mo.
Doerr Electric Corp., Cedarburg, Wis.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Howard Industries, Inc., Racine, Wis.
Howell Electric Motors Co., Howell, Mich.
Janette Elect. Mfg. Co., Morton Grove, Ill.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich. (hydraulic)
Lima Electric Motor Co., Inc., The, Lima, O.
Link-Belt Co., Chicago, Ill.
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Philadelphia Gear Corp., Philadelphia, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U.S. Electrical Motors, Inc., Los Angeles, Calif.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

GENERATORS, ELECTRIC PORTABLE, ENGINE DRIVEN

(specifically designed for supplying power to power tools)

Consolidated Diesel Electric Corp., Stamford, Conn.
Electric Machinery Mfg. Co., Minneapolis, Minn.

Howard Industries, Inc., Racine, Wis.
Kato Engineering Co., Mankato, Minn.
Marathon Electric Mfg. Corp., Wausau, Wis.
Onan & Sons, Inc., D. W., Minneapolis, Minn.
Thor Power Tool Co., Aurora, Ill.

GENERATORS, STEAM, ELECTRIC (Electrically "Fired" Boilers)

Hill Diesel Engine Corp., Lansing, Mich.
Lattner Mfg. Co., P. M., Cedar Rapids, Ia.
Pantex Mfg. Corp., Pawtucket, R. I.
Precision Parts Corp., Nashville, Tenn.
Tejax Engineering Corp., Pawtucket, R. I.

GLASS, HEAT ABSORBING

See Windows, Heat Insulating

GLASS PIPE

See Pipe, Glass

GLASSES, GAGE

Associated Valve Co., North Wales, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Specialty Mfg. Co., Chicago, Ill.
Corning Glass Works, Corning, N. Y.
Defender Instrument & Regulator Co., Boody, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Henry Valve Co., Melrose Park, Ill.
Libbey-Owens-Ford Glass Co., Toledo, O.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
New York Air Valve Corp., Brooklyn, N. Y.
OPW Corp., Cincinnati, O.
Penberty Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., Florham Park, N. J.
Swift Lubricator Co., The, Elmira, N. Y.
Uehling Instrument Co., Paterson, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.

GLASSES, SIGHT, FOR PIPE LINES

Allin Mfg. Co., Chicago, Ill.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Chesterton Co., A. W., Everett, Mass.
Cochrane Corp., Philadelphia, Pa.
Corning Glass Works, Corning, N. Y.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Norwood Associated Engineers, Inc., Springfield, Mass.
OPW-Jordan, Cincinnati, O.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Remco, Inc., Zelienople, Pa. (for refrigerant lines)
Sarco Co., Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Sporlan Valve Co., St. Louis, Mo.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., The, Elmira, N. Y.

GLOBE VALVES

See Valves, Globe

GLYCOL VAPORIZERS

See Units, Sterilizing, Air

GOVERNORS, PUMP

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cash Co., A. W., Decatur, Ill.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Schade Valve Mfg. Co., Philadelphia, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Synchro-Start Products, Inc., Skokie, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

GRILLES

See also Diffusers; Panels, Perforated, for Air Diffusion; Registers

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles, Calif.
Air-Factors, Inc., Covina, Calif.
AirGuide Plastics Corp., Miami, Fla. (molded nylon)
Air-Path Products Co., Baltimore, Md. (stamped steel)
Alton Mfg. Co., Dallas, Tex.
American Warming & Ventilating Co., Toledo, O.
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Carnes Corp., Verona, Wis.
Central Iron & Wire Works, Des Moines, Ia.
Char-Gale Mfg. Co., Minneapolis, Minn.
Connor Engineering Corp., Danbury, Conn.
Controlair Mfg. Co., Los Angeles, Calif.
Corbman Bros., Inc., Philadelphia, Pa.
Diamond Mfg. Co., Wyoming, Pa.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Erdle Perforating Co., Rochester, N. Y.
General Air Products Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Inc., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
International Mfg. Co., Oklahoma City, Okla.
Johnston & Chapman Co., Chicago, Ill.
Krueger Air Conditioning Corp., Tucson, Ariz.
Lenly Mfg. Co., Inc., Los Angeles, Calif.
Lima Register Co., The, Lima, O.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Metal Industries, Inc., Clearwater, Fla.
Midco Register Corp., St. Paul, Minn.
Mundt & Sons, Charles, Jersey City, N. J.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.
Viking Mfg. Corp., Cleveland, O.
Warren Register and Grille, Inc., Miami, Fla.
Waterloo Register Co., Inc., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago, Ill. (metal)
Wilson, Inc., Thomas C., Long Island City, N. Y.
Young Regulator Co., Cleveland, O.

GRILLES, DOOR

Barber-Colman Co., Rockford, Ill.
General Air Products Corp., Cedar Grove, N. J.
Independent Register Co., Cleveland, O.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Universal Diffuser Corp., Tuckahoe, N. Y.
Ventilouvre Co., Inc., The, Marietta, O.
Warren Register and Grille, Inc., Miami, Fla.
Waterloo Register Co., Inc., Waterloo, Ia.
Young Regulator Co., Cleveland, O.

GRINDERS AND GRINDING WHEELS, WELD

Airetool Mfg. Co., Springfield, O.
Albertson & Co., Inc., Sioux City, Ia.
Baldor Electric Co., St. Louis, Mo.
Black & Decker Mfg. Co., The, Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Franklin Balmar Corp., Baltimore, Md.
Gardner-Denver Co., Quincy, Ill.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Norton Co., Worcester, Mass.
Portable Electrical Tools, Inc., Chicago, Ill.
Raybestos-Manhattan, Inc., Passaic, N. J.
Remington Arms Co., Inc., Bridgeport, Conn.
Roto Tool Co., Cleveland, O.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., La Grange Park, Ill.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.
United States Electrical Tool Co., Cincinnati, O.
Wachs Co., E. H., The, Chicago, Ill.

GROOVERS, PLASTER, ELECTRIC, PORTABLE

Wodack Electric Tool Corp., Chicago, Ill.

GUARDS, THERMOSTAT, TO PREVENT TAMPERING

Barber-Colman Co., Rockford, Ill.
Better Engineered Controls, Los Angeles, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.

GUNS, POTS AND CANDLES, SMOKE AND SMUDGE, FOR TESTING AIR MOVEMENT

Air Control Products, Inc., Coopersville, Mich.
Design Engineers, Rockford, Ill.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Kilgore, Inc., International Flare-Signal Div., Westerville, O.
Mine Safety Appliances Co., Pittsburgh, Pa.

HAMMERS, ELECTRIC, PORTABLE

Black & Decker Mfg. Co., The, Towson, Md.
Hamer-Dril Co., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Phillips Drill Co., Michigan City, Ind.
Port City Machine & Tool Co., Muskegon, Mich. (Pittsburgh lock)
Porter-Cable Machine Co., Syracuse, N. Y.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn.
Rotor Tool Co., Cleveland, O.
Skil Corp., Chicago, Ill.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Super Slugger Co., Bedford, O.
Syntron Co., Homer City, Pa.

Thor Power Tool Co., Aurora, Ill.
Wodack Electric Tool Corp., Chicago, Ill.

HAND SHEARS

See Shears and Snips, Hand

HANGERS OR BRACKETS, RADIATOR

Arjac Products, Inc., Rochester, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Crawford Co., Chicago, Ill.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Hartmann Co., Chas., Brooklyn, N. Y.
Healy Ruff Co., St. Paul, Minn.
Jennison Co., The, Fitchburg, Mass. (Adjustable radiator foot rest)
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Modern Hanger Corp., The, Cleveland, O.
National-U. S. Radiator Corp., Johnstown, Pa.
Rittling Corp., The, Buffalo, N. Y.
Unistrut Products Co., Chicago, Ill.

HANGERS, PIPE, CONSTANT SUPPORT (SPRING)

Basic Engineers, Inc., Sharpsburg, Pa.
Bergen Pipesupport Corp., New York, N. Y.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J. (malleable iron; cast iron; steel)
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.

HANGERS AND SUPPORTS, DUCT

Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa. (galvanized)
Bergen Pipesupport Corp., New York, N. Y. (variable spring & constant supports)
Corbman Bros., Inc., Philadelphia, Pa.
Elcen Metal Products Co., Franklin Park, Ill.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J. (vibration)
Hall Co., Windsor Locks, Conn.
Hexdall Co., A. M., Morris, Ill. (duct and furnace round pipe, furnace, square)
Inland Steel Products Co., Milwaukee, Wis. (galvanized)
Korfund Co., Inc., Long Island City, N. Y.
Maurlee Co., Inc., Woodbury Heights, N. J.
Mine Safety Appliances Co., Velocity Power Tool Dept., Pittsburgh, Pa. (cartridge stud driver)
Modern Hanger Corp., The, Cleveland, O.
Moore Inc., Goodloe E., Danville, Ill.
Mueller Brass Co., Port Huron, Mich (perforated strap)
Omark Industries, Inc., Portland, Ore.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Redi-Bolt, Inc., East Chicago, Ind. (continuous threaded steel rod)
Remington Arms Co., Inc., Bridgeport, Conn. (stud, pin and threaded types)
Steel City Electric Co., Pittsburgh, Pa. (trapeze)
Unistrut Products Co., Chicago, Ill.
Williamson Co., Cincinnati, O. (galvanized)

HANGERS AND SUPPORTS, PIPE

Acme Steel Co., Chicago, Ill. (slotted angle)
Air-Path Products Co., Baltimore, Md. (inserts)
Align-O Pipe Guide Co., Barrington, N. J.
American Tube Products, Inc., West Warwick, R. I. (copper tube)
Automatic Sprinkler Corp. of America, Auto-Grip Div., Youngstown, O.
Basic Engineers Inc., Sharpsburg, Pa.
Bergen Pipesupport Corp., New York, N. Y. (variable spring, constant support and hanger assemblies)
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa. (spring and solid)
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn. (copper strap)
Crawford Co., Chicago, Ill.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J. (malleable iron; cast iron; steel)
Finn & Co., Inc., T.R., Hawthorne, N. J. (Rubber-in-shear & steel spring)
Flexonics Corp., Maywood, Ill. (pipe guides and anchors)
Frick Co., Waynesboro, Pa.
Gateway Engineering Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I. (strap hangers)
Gerrard & Co., A. J., Melrose Park, Ill. (strap)
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich. (clevis swivel)
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Handy Angle Div., The Lugall Co., Haverford, Pa.
Holub Industries, Inc., Sycamore, Ill. (steel and plastic)
Industrial Sheet Metal Work, Chicago, Ill.
Industrial Tubular Equipment Co., North Hollywood, Calif.
Korfund Co., Inc., Long Island City, N. Y.
L. K. Iron Works, New York, N. Y.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y. (spring hangers and roller hangers)
Midwest Piping Co., Inc., St. Louis, Mo.
Minerallac Electric Co., Chicago, Ill.
Mine Safety Appliances Co., Velocity Power Tool Dept., Pittsburgh, Pa. (cartridge stud driver)
Modern Hanger Corp., The, Cleveland, O.
Moore Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Corp., Detroit, Mich.
National-U. S. Radiator Corp., Johnstown, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa. (counterpoise)
Nibco, Inc., Elkhart, Ind. (copper tube)
Omark Industries, Inc., Portland, Ore.
Paine Co., Addison, Ill. (snug fit wire pipe hooks; pipe straps; rings and bolts; perforated hanger iron)
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Pipeline Coatings & Engineering Co., Los Angeles, Calif.
Piping Specialties, Inc., New York, N. Y. (anchor and guide for expansion joints; spring and all types)
Power Strut, Inc., Framingham, Mass.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn. (conduit clips)
Ravena Iron Co., Ravena, N. Y. (hook plates)
Rector Mineral Trading Corp., New York, N. Y.
Redi-Bolt, Inc., East Chicago, Ind. (continuous threaded steel rod)
Remington Arms Co., Inc., Bridgeport, Conn. (stud, threaded type)
Republic Steel Corp., Cleveland, O. (pressed steel inserts)
Ritter Pattern & Casting Co., New York, N. Y. (jack type adjustable tunnel stanchion and tunnel stanchion brackets with U bolts)
Rockwood Sprinkler Co., Worcester, Mass.
Saussé & Co., M. W., Los Angeles, Calif. (cork, rubber-in-shear, and spring)
Schaub Engineering Co., Fred H., Chicago, Ill. (pipe stands)
Steel City Electric Co., Pittsburgh, Pa. (clamps, clips, rollers, hangers)
Stic-Klip Mfg. Co., Inc., Cambridge, Mass. for ¼ and ¾ in. diam. pipe and tubing)
Unistrut Products Co., Chicago, Ill.
Vibration Mountings, Inc., Corona, N. Y. (vibration hangers)
Western Wire Products Co., St. Louis, Mo. (wire pipe hooks and perforated hanger iron; copper tubing hanger & slings; galvanized and copper coated pipe straps)
Williamson, Inc., T. D., Tulsa, Okla. (cradles)

HARD RUBBER PIPE AND FITTINGS

See Pipe, Hard Rubber; Fittings, Pipe, Hard Rubber

HARDWARE

See Parts for Heating and Air Conditioning Equipment

HEADERS, PIPE, WELDED

Albert Pipe Supply Co., Inc., Brooklyn, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Atlantic Pipe Bending & Fabricating Corp., Moonachie, N. J.
Biggs Boiler Wks. Co., The, E. Akron, O.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Nipple Mfg. Co., Oak Park, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe Supply & Coil Co., Inc., Elmwood, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Crotty Mfg. Corp., Flushing, Long Island, N. Y.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fibercast Co., Sand Spring, Okla.
Gray Tool Co., Houston, Tex.
Grinnell Co., Inc., Providence, R. I.
Heat & Power Corp., Baltimore, Md.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kellogg Co., M. W., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Portland Copper and Tank Works, Inc., South Portland, Me.
Reco Products Div., Recony Corp., New York, N. Y.
Red Jacket Co., Inc., Carnegie, Pa.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
Star Tubular Products Co., Chicago, Ill.
Taylor Engineering Corp., Detroit, Mich.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vilter Mfg. Co., Milwaukee, Wis.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.

HEADS, EXHAUST, FOR PIPE LINES

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O
Centrifix Corp., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Hoppes Mfg. Co., Inc., Springfield, O.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Swartwout Fabricators, Inc., Kokomo, Ind.
Wilson Engineering Corp., Chicago, Ill.
Wright-Austin Co., Detroit, Mich.

HEADS, SAFETY

Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Falls Industries, Inc., Solon, O.

HEADS, SPRINKLER, FOR FIRE PROTECTION

Grinnell Co., Inc., Providence, R. I.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.

HEAT EXCHANGERS

See Chillers, Water; Condensers, Refrigerating; Exchangers, Heat; Surface, Finned, Cooling; Surface, Finned, Heating

HEAT PUMP SWITCHING VALVES

See Valves, Switching, Heat Pump

HEAT PUMPS

See Unitary Air Conditioners, Year Around, Heat Pump (Reverse Refrigeration Cycle)

HEAT RECOVERY UNITS

See Units, Heat Recovery

HEAT REGENERATORS

See Units, Heat Recovery

HEATERS, AIR, DIRECT FIRED, COAL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

American Furnace Co., St. Louis, Mo.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Jackson & Church Co., Saginaw, Mich.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Meyer Furnace Co., The, Peoria, Ill.
National Heater Co., Inc., St. Paul, Minn.
Rosebraugh Co., W. W., Salem, Ore.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
Arkos Mfg. Co., Detroit, Mich.
Campbell Co., E. K., Kansas City, Mo.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems Co., Chicago, Ill.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Gas Machinery Co., Cleveland, O.
Inland Heater Corp., St. Paul, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Lennox Industries Inc., Des Moines, Ia.
Lennox Industries Inc., Columbus, O.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
National Heater Co., Inc., St. Paul, Mich.
Newcomb-Detroit Co., Detroit, Mich.
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
Reznor Mfg. Co., Mercer, Pa.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Arkla Air Conditioning Corp., Little Rock, Ark.
Arkos Mfg. Co., Detroit, Mich.
Auburn Burner Co., Auburn, Ind.
Besser Furnace and Air Conditioning Corp., Charlotte, N. C.
Burdett Mfg. Co., Chicago, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
David-Ludwig Co., Detroit, Mich.
Dravo Corp., Machinery Div., Pittsburgh, Pa
Drying Systems Co., Chicago, Ill.
Gaffers & Sattler, Los Angeles, Calif.
Hastings Air Control, Inc., Omaha, Nebr.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., St. Paul, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Jet-Heet, Inc., Englewood, N. J.
Johnson Heater Corp., Chelsea, Mass. (with and without ducts)
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Lennox Industries Inc., Des Moines, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
Mid-Continent Metal Products Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Montag Inc., Portland, Ore.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Heater Co., Inc., St. Paul, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Company, La Puente, Calif.
Peerless Mfg. Div., Dover Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Sterlairco, Inc., Westfield, Mass.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.
Tjernlund Mfg. Co., St. Paul, Minn.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Delaware, O.
Vapor Heating Corp., Chicago, Ill.
Wood Co., John, Conshohocken, Pa.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, AIR, DIRECT FIRED, GAS, PORTABLE, FOR SPACE HEATING

(State capacity)

Aeroil Products Co., Inc., South Hackensack, N. J. (125,000 to 500,000 Btu per hr)
Arkos Mfg. Co., Detroit, Mich.
Bica Co., Girard, O. (50,000-85,000 Btu)
Chicago Steel Furnace Co., Chicago, Ill.
Coleman Co., Inc., The, Wichita, Kans. (20,000 to 70,000 Btu per hr input)
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Insto-Gas Corp., Detroit, Mich.
Johnson Heater Corp., Chelsea, Mass. (500,000 Btu per hr)
Mammoth Furnace Co., Minneapolis, Minn.
National Heater Co., Inc., St. Paul, Minn.
Reznor Mfg. Co., Mercer, Pa. (400,000 to 2,000,000 Btu per hr output)
Stow Mfg. Co., Binghamton, N. Y. (200,000 Btu per hr cutput)
Summit Products Co., Uniontown, Pa. (125,000 to 250,000 Btu)
Union Chill Mat Co., Pittsburgh, Pa.
Vacuum Gas Burner Co., Olean, N. Y. (35,000 to 65,000 Btu per hr)
Weldit, Inc., Detroit, Mich. (100,000 Btu per hr; for LP Gas)

HEATERS, AIR, DIRECT-FIRED, GAS, SUSPENDED TYPE

Arkla Air Conditioning Corp., Little Rock, Ark.
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O.
Century Engineering Corp., Cedar Rapids, Ia.
Mammoth Furnace Co., Minneapolis, Minn.
Meyer Furnace Co., Inc., Peoria, Ill.
Montag, Inc., Portland, Ore.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Heater Co., Inc., St. Paul, Minn.
OverHead Heaters, Inc., Detroit, Mich.
Payne Co., La Puente, Calif.
Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O.
Williamson Co., The, Cincinnati, O.
Wood Co., John, Conshohocken, Pa.

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
Arkos Mfg. Co., Detroit, Mich.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Carrier Corp., Syracuse, N. Y.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems Co., Chicago, Ill.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Inland Heater Corp., St. Paul, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Jet-Heet, Inc., Englewood, N. J.
Johnson Heater Corp., Chelsea, Mass. (with and without ducts)
Lee Corp., Wilmington, Del.
Lennox Industries Inc., Des Moines, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis. Minn.
National Heater Co., Inc., St. Paul, Minn.
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
Reznor Mfg. Co., Mercer, Pa.
Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
Siebring Mfg. Co., George, Ia.
Tjernlund Mfg. Co., St. Paul, Minn.
Vapor Heating Corp., Chicago, Ill.
Wanson Corp., Lewiston, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE, FOR SPACE HEATING

Air Conditioning Engineering Co., Cambridge, Mass. (200,000; 285,000; 425,000 and 635,000 Btu)
Airtherm Mfg. Co., St. Louis, Mo. (400,000 to 2,000,000 Btu output per hr)
American Foundry & Furnace Co., Bloomington, Ill. (400,000-2,000,000 Btu per hr)
Arkos Mfg. Co., Detroit, Mich. (120,000 Btu per hr to 3,500,000 Btu per hr.)
Armstrong Furnace Co., Div. of National Union Electric Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Campbell Heating Co., Des Moines, Ia. (Up to 3,150,000 Btu)
Cauhorn Distributing Co., Detroit, Mich. (190,000 Btu)
Chicago Steel Furnace Co., Chicago, Ill.
Coleman Co., Inc., The, Wichita, Kans. (35,000 to 75,000 Btu per hr output)
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Interstate Heater Mfg. Co., Denver, Colo. (80,000-180,000 Btu per hr)
Jackson & Church Co., Saginaw, Mich. (400,000 Btu — 2,000,000 Btu per hr output at Bonnet)
Johnson Heater Corp., Chelsea, Mass. (500,000 Btu)
Lennox Industries Inc., Des Moines, Ia. (400,000 — 2,000,000 Btu per hr.)
Lennox Industries Inc., Marshalltown, Ia. (245,000 Btu per hr)
Mammoth Furnace Co., Minneapolis, Minn.
Master Vibrator Co., Dayton, O.
National Heater Co., Inc., St. Paul, Minn.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Reznor Mfg. Co., Mercer, Pa. (400,000 to 2,000,000 Btu per hr output)
Siebring Mfg. Co., George, Ia.
Silent Glow Oil Burner Co., Hartford, Conn. (100,000 - 1,000,000 Btu per hr)
Stow Mfg. Co., Binghamton, N. Y. (200,000 Btu per hr output)
Tjernlund Mfg. Co., St. Paul, Minn.
Wood Co., John, Conshohocken, Pa.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Furnace Co., St. Louis, Mo.
Arkos Mfg. Co., Detroit, Mich.
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Auburn Burner Co., Edgerton, O.

Bard Mfg. Co., Bryan, O.
Besser Furnace and Air Conditioning Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
General Automatic Products Corp., Baltimore, Md.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Inland Heater Corp., St. Paul, Minn.
Interstate Heater Mfg. Co., Denver, Colo.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Kaustine Furnace & Tank Corp., Perry, N. Y.
Lee Corp., Wilmington, Del.
Lennox Industries Inc., Des Moines, Ia.
Lennox Industries Inc., Columbus, O.
Mammoth Furnace Co., Minneapolis, Minn.
Meyer Furnace Co., The, Peoria, Ill.
Montag Inc., Portland, Ore.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Heater Co., Inc., St. Paul, Minn.
Olsen Mfg. Co., C. A., Elyria, O.
OverHead Heaters, Inc., Detroit, Mich.
Patten Co., J. V., Sycamore, Ill.
Reznor Mfg. Co., Mercer, Pa.
Scaife Co., Oakmont, Pa.
Silent Automatic Products, Cleveland, O.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Syncromatic Corp., Watertown, Wis.
Thermo-Products, Inc., North Judson, Ind.
Tjernlund Mfg. Co., St. Paul, Minn.
Viking Mfg. Corp., Cleveland, O.
Waterman-Waterbury Co., The, Minneapolis, Minn.
Weatherall Engineers, Inc., Providence, R. I.
Williams Div., Eureka Williams Corp., Bloomington, Ill.
Williamson Co., Cincinnati, O.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, CONVECTION

See Radiation, Convection Type

HEATERS, DUCT, ELECTRIC

Electrend Products Corp., St. Joseph, Mich.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Falcon Equipment Co., New Brighton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Montgomery Bros., San Francisco, Calif.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Tenney Engineering, Inc., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Waage Electric, Inc., Kenilworth, N. J.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilson Electric Furnace Co., Rossville, Ga.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg Co., Inc., Linden, N. J.

HEATERS, DUCT, GAS

Arkla Air Conditioning Corp., Little Rock, Ark.
Arkos Mfg. Co., Detroit, Mich.
Bryant Mfg. Co., Indianapolis, Ind.
Campbell Heating Co., Des Moines, Ia.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Day & Night Mfg. Co., La Puente, Calif.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders Corp., Heating Div., Trenton, N. J.
Gaffers & Sattler, Los Angeles, Calif.
Hastings Air Control, Inc., Omaha, Nebr.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., St. Paul, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Heater Corp., Chelsea, Mass.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries Inc., Columbus, O.
Lennox Industries Inc., Des Moines, Ia.
Lennox Industries Inc., Marshalltown, Ia.
Mammoth Furnace Co., Minneapolis, Minn.
Maxon Premix Burner Co., Muncie, Ind.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National Heater Co., Inc., St. Paul, Minn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
Olsen Mfg. Co., C. A., Elyria, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Company, La Puente, Calif.
Peerless Mfg. Div., Dover Corp., Louisville.
Reznor Mfg. Co., Mercer, Pa.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sterlairco, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Thermo-Products, Inc., North Judson, Ind.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Delaware, O.
Viking Mfg. Corp., Cleveland, O.
Williamson Co., The, Cincinnati, O.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

HEATERS, DUCT, OIL FIRED

Arkos Mfg. Co., Detroit, Mich.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Inland Heater Corp., St. Paul, Minn.
Interstate Heater Mfg. Co., Denver, Colo.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries Inc., Des Moines, Ia.
Mammoth Furnace Co., Minneapolis, Minn.
National Heater Co., Inc., St. Paul, Minn.
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
OverHead Heaters, Inc., Detroit, Mich.
Republic Products Co., Philadelphia, Pa.
Thermo-Products, Inc., North Judson, Ind.
Viking Mfg. Corp., Cleveland, O.
Williamson Co., The, Cincinnati, O.

HEATERS, ELECTRIC, OIL-HEATING, FOR PREVENTING FOAMING IN CRANKCASE COMPRESSOR OIL

Electrofilm, Inc., North Hollywood, Calif.
Electro-Therm, Inc., Silver Spring, Md.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, FEEDWATER

See Deaerators

HEATERS, GASOLINE FIRED (FOR AIRCRAFT AND PORTABLE GROUND USE)

Coleman Co., Inc., The, Wichita, Ks.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
National Heater Co., Inc., St. Paul, Minn.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.

HEATERS, INDIRECT, SUBMERGED

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alstrom Corp., The, New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg Co., Dover, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
General Ceramics Corp., Keasbey, N. J. (graphite)
General Fittings Co., East Greenwich, R. I.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark.
Newcomb-Detroit Co., Detroit, Mich. (gas)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Western Blower Co., Seattle, Wash.
Yula Corp., Bronx, N. Y.

HEATERS, OIL

See Preheaters, Fuel Oil; Units, Fuel Oil, Heating, Pumping and Straining

HEATERS, OIL TANK, SUCTION BELL

Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Brown Fintube Co., Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Hauck Mfg. Co., Brooklyn, N. Y.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Manning & Lewis Engineering Co., Newark, N. J.
Old Dominion Iron & Steel Corp., Richmond, Va.
Richmond Engineering Co., Inc., Richmond, Va.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.
Yula Corp., Bronx, N. Y.

HEATERS, RADIATION, FOR SUPPLYING HOT WATER RADIATION FROM STEAM BOILER

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Alstrom Corp., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Mar-Coil Heater Co., Union City, N. J.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Viking Mfg. Corp., Cleveland, O.
Yula Corp., Bronx, N. Y.

HEATERS, STEAM JET, FOR LIQUIDS

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc.. New York, N. Y.
Duriron Co., Inc., The, Dayton, O.
Heil Process Equipment Corp., Cleveland, O.
National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y. (steam-diffusers)
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Sims Pump Valve Co., Hoboken, N. J.
Vic Mfg. Co., Minneapolis, Minn.

HEATERS, STRIP AND IMMERSION, ELECTRIC

Acme Electric Heating Co., Boston, Mass.
American Instrument Co., Inc., Silver Spring, Md.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
General Electric Co., Shelbyville, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Heil Process Equipment Corp., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.

Red Spot Electric Co., Tacoma, Wash.
S&C Mfg. Co., Cincinnati, O.
Trent Inc., Philadelphia, Pa.
Tuttle Electric Products, Inc., Kirkland, Ill. (electric heating elements for room air conditioners)
Vulcan Electric Co., Danvers, Mass.
Waage Electric. Inc., Kenilworth, N. J.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

HEATERS, SUSPENDED, RADIANT, ELECTRIC

Ampere Industries. Newark, N. J.
Berko Electric Mfg. Co., Queens Village, N. Y.
Corning Glass Works, Corning, N. Y.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Heatmore, Inc., Brooklyn, N. Y.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Ilg Electric Ventilating Co., Chicago, Ill.
LaSalle Products, Inc., Buffalo, N. Y.
Quartz Products Corp., Plainfield, N. J.
S&C Mfg. Co., Cincinnati, O.
Salton Mfg. Co., Inc., New York, N. Y.
Thermador Electrical Mfg., Los Angeles, Calif.
ThermoRay Corp., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Union Chill Mat Co., Pittsburgh, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

Bettcher Mfg. Corp., The, Cleveland, O.
Ilg Electric Ventilating Co., Chicago, Ill.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Union Chill Mat Co., Pittsburgh, Pa.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT

Acme Electric Heating Co., Boston, Mass.
Ceilheat, Inc., Knoxville, Tenn.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electrofilm, Inc., North Hollywood, Calif.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Everwarm, Inc., Knoxville, Tenn.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatmore, Inc., Brooklyn, N. Y.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Ilg Electric Ventilating Co., Chicago, Ill.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
LaSalle Products, Inc., Buffalo, N. Y.
Lintern Corp., Painesville, O.
Marviray, Inc., Newark, N. J.
Modernheat Cable Corp., Kingsport, Tenn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Sunwarm, Inc., Kingsport, Tenn.
Thermador Electrical Mfg., Los Angeles.
Vapor Heating Corp., Chicago, Ill.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Zell-Aire Corp., Reading, Pa.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT, EXPLOSION PROOF

Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Ilg Electric Ventilating Co., Chicago, Ill.
Nesbitt, Inc., John J., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

Airtherm Mfg. Co., St. Louis, Mo.
American Furnace Co., St. Louis, Mo.
American-Standard Industrial Div., Detroit, Mich.
Arkla Air Conditioning Corp., Little Rock, Ark.
Barwick Mfg. Corp., Wichita, Kan.
Bryant Mfg. Co., Indianapolis, Ind.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Day & Night Mfg. Co., La Puente, Calif.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Gaffers & Sattler, Los Angeles, Calif.
Grinnell Co., Inc., Providence, R. I.
Hastings Air Control, Inc., Omaha, Nebr.
Henry Furnace Co., The, Medina, O.
Ilg Electric Ventilating Co., Chicago, Ill.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lennox Industries Inc., Des Moines, Ia.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
Ohio Foundry & Mfg. Co., Steubenville, O.
Olsen Mfg. Co., C. A., Elyria, O.
Payne Company, La Puente, Calif.
Peerless Mfg. Div., Dover Corp., Louisville, Ky.
Pioneer Mfg. Co., Los Angeles, Calif.
Reznor Mfg. Co., Mercer, Pa.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Sterlairco, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Temco, Inc., Nashville, Tenn.
Trane Co., The, La Crosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Delaware, O.
Vacuum Gas Burner Co., Olean, N. Y.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Worthington Corp., East Orange, N. J.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

Interstate Heater Mfg. Co., Denver, Colo.
Sterlairco, Inc., Westfield, Mass.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airfan Engineering Co., Los Angeles, Calif.
Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Industrial Div., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chicago Steel Furnace Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Heating Div., Trenton, N. J.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Recold Corp., Los Angeles, Calif.
Rittling Corp., The, Buffalo, N. Y.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Young Radiator Corp., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Industrial Div., Detroit, Mich.
Blazer & Son, M., Passiac, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chicago Steel Furnace Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Recold Corp., Los Angeles, Calif.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Industrial Div., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Heating Div., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Hartzell Propeller Fan Co., Piqua, O.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Kritzer Radiant Coils, Inc., Batavia, Ill.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Modine Mfg. Co., Racine, Wis.
Muckle Mfg. Co., Owatonna, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Industrial Div., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.

Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Heating Div., Trenton, N. J.
Gallaher Co., The, Omaha, Neb.
Grinnell Co., Inc., Providence, R. I.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Batavia, Ill.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Trane Co., The, La Crosse, Wis.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston. Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J. (Revolving)
Young Radiator Co., Racine, Wis.

HEATERS, VENTILATION

See Ventilators, Roof, Fan; Ventilators, Unit; Surface, Finned, Heating; Units, Makeup Air, Heating and Ventilating, Package Type, Steam or Hot Water; Units, Makeup Air, Heating and Ventilating, Horizontal Package Type, Direct Fired, Oil, and Gas

HEATERS, WALL, CIRCULATING, ELECTRIC

Arvin Industries, Inc., Columbus, Ind.
Broan Mfg. Co., Inc., Hartford, Wis.
Ceilheat, Inc., Knoxville, Tenn.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Electrend Products Corp., St. Joseph, Mich.
Electric Heating & Cooling, Inc., Newark, N. J.
Electro-Ray Co., Inc., Vancouver, Wash.
Everwarm, Inc., Knoxville, Tenn.
General Electric Co., Wiring Device Dept., Providence, R. I.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
LaSalle Products, Inc., Buffalo, N. Y.
Modernheat Cable Corp., Kingsport, Tenn.
Sunwarm, Inc., Kingsport, Tenn.
Tennessee Plastics, Inc., Johnson City, Tenn.
Thermador Electrical Mfg., Los Angeles, Calif.
ThermoRay Corp., Newark, N. J.
Trade-Wind Div., Robbins & Myers, Inc., Pico Rivera, Calif. (wall insert type)
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L. Pittsburgh, Pa.

HEATERS, WALL, CIRCULATING, GAS FIRED

Advance Furnace Co., Wichita, Kans.
Coleman Co., Inc., The, Wichita, Kan.
Day & Night Mfg. Co., La Puente, Calif.
Dearborn Stove Co., Dallas, Tex.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Kresky Mfg. Co., Inc., Petaluma, Calif.
Lennox Industries Inc., Marshalltown, Ia.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Ohio Foundry & Mfg. Co., Steubenville, O.
Payne Company, La Puente, Calif.
Peerless Mfg. Div., Dover Corp., Pittsburgh.
Pioneer Mfg. Co., Los Angeles, Calif.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Temco, Inc., Nashville, Tenn.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Zink Co., John, Tulsa, Okla.

HEATERS, WALL, CIRCULATING, OIL FIRED

Consumer Products, Motor Wheel Corp., Lansing, Mich.
Kleer Kleen Mfg. Co., Hayward, Calif.
Kresky Mfg. Co., Petaluma, Calif.
Scaife Co., Oakmont, Pa.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.

HEATERS, WATER, AIR-TANKLESS

Tankless Water Heater and Compression Tank Combined

American Tube Products, Inc., West Warwick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
General Fittings Co., East Greenwich, R. I.
Lewis & Saunders, Inc., Lakeport, N. H.
Mar-Coil Heater Co., Union City, N. J.
Old Dominion Iron & Steel Corp., Richmond, Va.

HEATERS, WATER, CAST IRON, COAL FIRED

Adams Co., The, Dubuque, Ia.
Burnham Corp., Irvington, N. Y.
National-U. S. Radiator Corp., Johnstown, Pa.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
Weil-McLain Co., Michigan City, Ind.

HEATERS, WATER, ELECTRIC

Allcraft Mfg. Co., Inc., Cambridge, Mass.
American-Standard Plumbing & Heating Div., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Can Arm Corp., Champlain, N. Y.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Consumer Products, Motor Wheel Corp., Lansing, Mich.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electro-Therm, Inc., Silver Spring, Md.
Frigidaire Div., General Motors Corp., Dayton, O.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Hotpoint, Chicago, Ill.
Hotstream Heater Co., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Koven & Bro. Inc., L. O., Jersey City, N. J.
McGraw-Edison Co., Clark Div. & Tropic-Aire Div., Chicago, Ill.
Modern Water Equipment Co., Freeport, Ill.
Mor-Flo Heater Corp., Cleveland, O.
National-U. S. Radiator Corp., Johnstown, Pa.
Pioneer Mfg. Co., Los Angeles, Calif.
Precision Parts Corp., Nashville, Tenn.
Red Spot Electric Co., Tacoma, Wash.
Republic Appliance Corp., Los Angeles, Calif.
Rheem Mfg. Co., Chicago, Ill.
Smith Corp., A. O., Permaglas Div., Kankakee, Ill.
Thermador Electric Mfg., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, GAS FIRED

Ajax Boiler & Heater Co., Gardena, Calif.
Aldrich Co., Wyoming, Ill.
Allcraft Mfg. Co., Inc., Cambridge, Mass.
American-Standard Plumbing & Heating Div., New York, N. Y.
Auburn-Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bica Co., Girard, O.
Bock Corp., Madison, Wis.
Bryan Steam Corp., Peru, Ind.
Bryant Mfg. Co., Indianapolis, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Consumer Products, Motor Wheel Corp., Lansing, Mich.
Crane Co., Chicago, Ill.
Day & Night Mfg. Co., La Puente, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edgewood Mfg. Co., El Monte, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Equipco, Inc., Portland, Ore.
Everhot Heater Div., Temprite Products, Detroit, Mich.
Hotstream Heater Co., Cleveland, O.
Hydrotherm, Inc., Northvale, N. J.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Laars Engineers, North Hollywood, Calif.
Malsbary Mfg. Co., Oakland, Calif.
McGraw-Edison Co., Clark Div & Tropic-Aire Div., Chicago, Ill.
Mor-Flo Heater Corp., Cleveland, O.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Pioneer Mfg. Co., Los Angeles, Calif.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Raypak Co., Inc., El Monte, Calif.
Republic Appliance Corp., Los Angeles, Calif.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Downey, Calif.
Ruud Mfg. Co., Kalamazoo, Mich.
Smith Corp., A. O., Permaglas Div., Kankakee, Ill.
Schoedinger, Inc., F. O., Columbus, O.
Sellers Engineering Co., Chicago, Ill.
Smith Co., Inc., H. B., The, Westfield, Mass.
Stout & Sons, David, St. Louis, Mo.
Trageser Copper Works, Inc., Jamaica, N. Y.
Viking Mfg. Corp., Cleveland, O.
Western Boiler Co., Los Angeles, Calif.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, INDIRECT

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Ajax Boiler & Heater Co., Gardena, Calif.
Alstrom Corp., New York, N. Y.
American-Standard Plumbing & Heating Div., New York, N. Y.
American Tube Products, Inc., West Warwick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Bernstrom, Inc., C. R., Providence. R. I.
Birchfield Boiler, Inc., Tacoma, Wash.
Bryan Steam Corp., Peru, Ind.
Bryant Mfg. Co., Indianapolis, Ind.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N.J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Ellicott Fabricators, Inc., Baltimore, Md.
General Fittings Co., East Greenwich, R. I.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Harrison Sheet Steel Co., Chicago, Ill.
Hydrotherm, Inc., Northvale, N. J.
Kam Products Corp., Brooklyn, N. Y.
Killebrew Engineering Corp., St. Louis, Mo.
Lewis & Saunders, Inc., Lakeport, N. H.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., Johnstown, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Rite Engineering & Mfg. Corp., Downey, Calif.
Sellers Engineering Co., Chicago, Ill.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.

Water Tube Boiler & Tank Co., Chicago, Ill.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Corp., Bronx, N. Y.

HEATERS, WATER, INDIRECT, COMBINATION TANK AND TANKLESS

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alstrom Corp., New York, N. Y.
American Tube Products, Inc., West Warwick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros, Inc., Minneapolis, Minn.
Buxton Mfg. Co., Dover, N. J.
Carpenter Heating & Air Conditioning Co., Cleveland, O.
Crotty Mfg. Corp., Flushing, Long Island, N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Ellicott Fabricators, Inc., Baltimore, Md.
General Ceramics Corp., Keasbey, N. J. (graphite)
General Fittings Co., East Greenwich, R. I.
Hydrotherm, Inc., Northvale, N. J.
Kam Products Corp., Brooklyn, N. Y.
Killebrew Engineering Corp., St. Louis, Mo
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Water Tube Boiler & Tank Co., Chicago, Ill.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Corp., Bronx, N. Y.

HEATERS, WATER, OIL FIRED

Aeroil Products Co., Inc., South Hackensack, N. J.
Ajax Boiler & Heater Co., Gardena, Calif.
Aldrich Co., Wyoming, Ill.
Auburn Burner Co., Auburn, Ind.
Bock Corp., Madison, Wis.
Bryan Steam Corp., Peru, Ind.
Burnham Corp., Irvington, N. Y.
Carlin Co., The, Wethersfield, Conn.
Century Engineering Corp., Cedar Rapids, Ia.
Consumer Products, Motor Wheel Corp., Lansing, Mich.
Edwards Engineering Corp., Pompton Plains, N. J.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J.
Hotstream Heater Co., Cleveland, O.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Co., S. T., Oakland, Calif.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Petro, Cleveland, O.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Downey, Calif.
Smith Co., Inc., H. B., The, Westfield, Mass.
Vapor Heating Corp., Chicago, Ill.
Viking Mfg. Corp., Cleveland, O.
Way-Wolff Associates, Inc., Long Island City, N. Y.
Western Boiler Co., Los Angeles, Calif.
Wood Co., John, Conshohocken, Pa.

HEATERS, WATER, STEAM, INSTANTANEOUS

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Aerco Corp., Northvale, N. J.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American-Standard Industrial Div., Detroit, Mich.
American Tube Products, Inc., West Warwick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Bernstrom, Inc., C. R., Providence, R. I.
Buxton Mfg. Co., Dover, N. J.
Coe Mfg. Co., Painesville, O. (safety water heater)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ellicott Fabricators, Inc., Baltimore, Md.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., East Greenwich, R. I.
Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Kam Products Corp., Brooklyn, N. Y.
Killebrew Engineering Corp., St. Louis, Mo
Koven & Bro. Inc., L. O., Jersey City, N. J.
Lewis & Saunders, Inc., Lakeport, N. H.
Lindy Heaters, Inc., New York, N. Y.
Malsbary Mfg. Co., Oakland, Calif.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry, Inc., Marion, Ind.
National Pipe Bending Co., New Haven, Conn.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Pacific Steel Boiler Div., National U.S. Radiator Corp., Johnstown, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pick Mfg. Co., West Bend, Wis. (direct steam injection)
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Rite Engineering & Mfg. Corp., Downey, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Sirod Corp., Milwaukee, Wis.
Taco Heaters, Inc., Cranston, R. I.
Viking Mfg. Corp., Cleveland, O.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Corp., Bronx, N. Y.

HEATERS, WATER, STEAM, STORAGE

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Aerco Corp., Northvale, N. J.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
Baker, Inc., C. I., Lorain, O.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros, Inc., Minneapolis, Minn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Ellicott Fabricators, Inc., Baltimore, Md.
General Fittings Co., East Greenwich, R. I.
Johnson Corp., The, Three Rivers, Mich.
Kam Products Corp., Brooklyn, N. Y.
Killebrew Engineering Corp., St. Louis, Mo.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Lindy Heaters, Inc., New York, N. Y.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Marion Machine Foundry, Inc., Marion, Ind.
National Pipe Bending Co., New Haven, Conn.
Old Dominion Iron & Steel Corp., Richmond, Va.
Pacific Steel Boiler Div., National U.S. Radiator Corp., Johnstown, Pa.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Process Engineering, Inc., Methuen, Mass.
Quaker City Iron Works, Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stout & Sons, David, St. Louis, Mo.
Taco Heaters, Inc., Cranston, R. I.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Tranter Mfg. Inc., Lansing, Mich.
Viking Mfg. Corp., Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
Water Tube Boiler & Tank Co., Chicago, Ill.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Corp., Bronx, N. Y.

HEATERS, WATER, STEEL, COAL FIRED

Finnigan & Co., Inc., J. J., Atlanta, Ga.
Johnston Bros., Inc., Ferrysburg, Mich.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.

HEATING BOILERS

See Boilers, Heating

HEATING COILS

See Surface, Finned, Heating

HEATING COILS, FINNED

See Surface, Finned, Heating

HEATING SURFACE

See Surface, Finned, Heating

HEATING AND VENTILATING UNITS

See Units, Heating and Ventilating, Horizontal Package Type

HEATING AND VENTILATING UNITS, MAKEUP AIR, PACKAGE TYPE, DIRECT FIRED, OIL

See Units, Makeup Air, Heating and Ventilating, Horizontal Package Type, Direct Fired, Oil, and Gas; Units, Makeup Air, Heating and Ventilating, Package Type, Steam or Hot Water

HIGH TEMPERATURE HOT WATER GENERATORS

See Boilers

HIGH VELOCITY AIR SYSTEM PIPE

See Ducts, Spiral Welded

HIGH VELOCITY MIXING UNITS, SOUND AND VOLUME CONTROL, FOR AIR CONDITIONING SYSTEMS

See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

HOISTS, PORTABLE, FOR INSTALLING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT

Aluminum Products, Inc., Fort Lauderdale, Fla.
American Gauge & Mfg. Co., Dayton, O.
Broad Crane & Engineering Service Co., Detroit, Mich.
Burtchaell Heating Co., Portland, Ore.
Cady Metal Fabricating Co., North Tonawanda, N. Y.
Chicago Pneumatic Tool Co., New York, N. Y.

Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Detroit Hoist & Machine Co., Detroit, Mich.
Gardner-Denver Co., Quincy, Ill.
Griphoist, Inc., San Francisco, Calif.
Harnischfeger Corp., Milwaukee, Wis.
Hastings Air Control, Inc., Omaha, Nebr.
Indus Corp., Indianapolis, Ind.
Lug-All Co., The, Haverford, Pa.
Memco Crane Co., Oklahoma City, Okla.
Philadelphia Hoist Div., Industrial Enterprises, Inc., Doylestown, Pa.
Thern Machine Co., Winona, Minn.
Thor Power Tool Co., Aurora, Ill.
Wallace Products Co., B. E., Exton, Pa. (adjustable tripods, gantries)
Wise Engineering Co., Newark, N. J.

HOLDERS AND FILES, CATALOG, FOR ENGINEERS' AND CONTRACTORS' OFFICES

Geneva Mfg. Co., South Elgin, Ill.
Momar Industries, Inc., Chicago, Ill.

HOODS, FUME DISPOSAL, CORROSION RESISTANT

Arco Products, Automotive Rubber Co., Detroit, Mich.
Argo Plastic Products, Cleveland, O.
Ceilcote, Inc., Cleveland, O.
Corite Products, Inc., Chicago, Ill. (plastic)
David-Ludwig Co., Detroit, Mich.
DuVerre, Inc., Buffalo, N. Y. (plastic)
Electro-Chemical Products Corp., Cleveland, O. (PVC plastic)
Heil Process Equipment Corp., Cleveland, O.
Kirk & Blum Mfg. Co., Cincinnati, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Molded Fiber Glass Sheet Co., Ashtabula, O.
South Bend Air Products, Inc., South Bend, Ind.
United Sheet Metal Co., Inc., Columbus, O.

HOODS, FUME DISPOSAL, LABORATORY

Air Pollution Control Div., John Wood Co., Bernardsville, N. J.
Atlas Mineral Products Co., Mertztown, Pa.
Ceilcote, Inc., Cleveland, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (plastic)
Corite Products, Inc., Chicago, Ill. (plastic)
DuVerre, Inc., Buffalo, N. Y. (plastic)
Ervite Corp., Erie, Pa.
General Metals, Inc., Greensboro, N. C.
Griffin & Co., Louisville, Ky.
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC and polyethylene)
Kirk & Blum Mfg. Co., Cincinnati, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Schneible Co., Claude B., Detroit, Mich.
Sheldon Equipment Co., E. H., Muskegon, Mich.
United Sheet Metal Co., Inc., Columbus, O.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Zack Co., The, Chicago, Ill.

HOSE CLAMPS

See Clamps, Hose

HOSE, FLEXIBLE, METAL, AND FITTINGS

Aeroquip Corp., Jackson, Mich.
Airaterra (Roylyn Products), Glendale, Calif.
Allied Metal Hose Co., Long Island City, N. Y.
Ammerman, Inc., Stillwater, Minn.
Anaconda Metal Hose Div., American Brass Co., Waterbury, Conn.
Argo Plastic Products, Cleveland, O.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Atlantic Metal Hose Co., Inc., New York.
Breeze Corporations, Inc., Union, N. J.
Chiksan Co., Brea, Calif.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Croker Fire Protection Co., New York, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Fine Products Co., Berwyn, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexaust Co., New York, N. Y.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexonics Corp., Maywood, Ill.
Goodall Rubber Co., Trenton, N. J.
International Metal Hose Co., Bellevue, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Korfund Co., Inc., Long Island City, N. Y.
Lenz Co., Dayton, O.
Marquette Coppersmithing Co., Philadelphia, Pa.
Mic-Lin Co., Maple Shade, N. J.
Packless Metal Hose, Inc., Mt. Vernon, N. Y.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Seamlex Co., Inc., Long Island City, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Techniflex Div., Port Jervis, N. Y.
Titeflex, Inc., East Springfield, Mass.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.
Vibration Mountings, Inc., Corona, N. Y.
Zallea Brothers, Wilmington, Del.

HOSE, NON-METAL, AND FITTINGS

Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Airaterra (Roylyn Products), Glendale, Calif.
Ammerman Inc., Stillwater, Minn.
Anaconda Metal Hose Div., American Brass Co., Waterbury, Conn.
Anchor Coupling Co. Inc., Libertyville, Ill.
Anchor Packing Co., Philadelphia, Pa.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Binks Mfg. Co., Chicago, Ill.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Burton Mfg. Co., Middlefield, O.
Continental Rubber Works, Erie, Pa.
Dayton Rubber Co., Dayton, O.
DeVilbiss Co., The, Toledo, O.
Electric Hose & Rubber Co., Wilmington, Del.
Fine Products Co., Berwyn, Ill.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Gates Rubber Co., The, Denver, Colo.
Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins Inc., Stamford, Conn.
Hofmann Engineering Co., Chicago, Ill.
Hose Accessories Co., Philadelphia, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Korfund Co., Inc., Long Island City, N. Y. (rubber)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rubber)
Lenz Co., Dayton, O.
Mercer Rubber Co., Hamilton Sq., N. J.
Newage Industries, Inc., Jenkintown, Pa.
New York Belting & Packing Co., Passaic, N. J.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Polymer Corp., The, Reading, Pa. (nylon pressure tubing and hose)
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber and Tire Corp., Youngstown, O.
Research Vacuum Supply Co., Chicago, Ill.
Resistoflex Corp., Roseland, N. J.
Snap-Tite, Inc., Union City, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Thermoid Co., Trenton, N. J.
Thor Power Tool Co., Aurora, Ill.
Titeflex, Inc., East Springfield, Mass. (teflon)
United States Rubber Co., New York, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Vortox Co., Claremont, Calif.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

HOSE, REFRIGERANT CHARGING

Aeroquip Corp., Jackson, Mich.
Electric Hose & Rubber Co., Wilmington, Del.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Div., Port Jervis, N. Y.

HOSE, VENTILATING

See Ducts and Duct Fittings, Prefabricated, Non-Flexible, Non-Metalic

HOSPITAL OPERATING ROOM AIR CONDITIONING UNITS

See Unitary Air Conditioners, Exclusively for Hospital Operating Rooms

HOT GAS DEFROSTING

See Systems, Hot Gas Defrosting for Refrigeration

HOT WATER HEATING AND CHILLED WATER SYSTEMS, BALANCING ELBOWS AND TEES FOR

See Elbows and Tees, Balancing, for Hot Water Heating and Chilled Water Systems

HOT WATER HEATING SYSTEMS

See Systems, Heating, Hot Water

HOT WATER PRESSURE REGULATORS

See Regulators, Pressure, Hot Water Heating Systems

HOUSINGS, FAN, CENTRIFUGAL

(Housing only—not complete fans)

Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airfan Engineering Co., Los Angeles, Calif.
Ammerman Inc., Stillwater, Minn.
Barry Blower Co., Minneapolis, Minn.
Brookside Corp., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Ervite Corp., Erie, Pa.
Garden City Fan Co., Niles, Mich.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Haveg Industries, Inc., Wilmington, Del. (plastic for corrosive fumes)
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Morrison Products, Inc., Cleveland, O.
Phoenix Products Co., Milwaukee, Wis. (spun inlets)
Power Engineering Corp., Mingo Jct., O.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., Middletown, Conn.
Torit Mfg. Co., St. Paul, Minn.
Torrington Mfg. Co., The, Torrington, Conn.
United Sheet Metal Co., Inc., Columbus, O.
United States Air Conditioning Corp., Delaware, O.
Utica Products, Inc., Utica, N. Y.

HOUSINGS, FAN, PROPELLER

(Housing only—not complete fans)

Allen Cooler & Ventilator, Inc., Rochester, Mich.
Ammerman Inc., Stillwater, Minn.
Brookside Corp., McCordsville, Ind.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Commercial Shearing & Stamping Co., Youngstown, O.
Ervite Corp., Erie, Pa.
Haveg Industries, Inc., Wilmington, Del. (plastic for corrosive fumes)
Industrial Plastic Fabricators, Norwood, Mass. (PVC)

International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Phoenix Products Co., Milwaukee, Wis. (spun inlets)
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
United Sheet Metal Co., Inc., Columbus, O.

HUMIDIFIERS, CENTRAL PLANT

Air & Refrigeration Corp., New York, N. Y.
American Moistening Co., Cleveland, N. C.
American-Standard Industrial Div., Detroit, Mich.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Cleveland Humidifier Co., Cleveland, O.
Farr Co., Los Angeles, Calif.
General Filters, Inc., Novi, Mich.
HERRmidifier Co., Lancaster, Pa.
Humidaire Corp., Genoa, Ill.
Johnson Service Co., Milwaukee, Wis.
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers for humidifiers)
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Niagara Blower Co., New York, N. Y.
Norky Mfg. Corp., Covington, Ky.
Parks-Cramer Co., Fitchburg, Mass.
Powers Regulator Co., Skokie, Ill.
Rempe Co., Chicago, Ill.
Research Products Corp., Madison, Wis.
Skuttle Mfg. Co., Milford, Mich.
Southworth Machine Co., Portland, Me.
Surface Combustion Corp., Toledo, O.
Swan Humidifier Co., Ballston Spa., N. Y.
Trane Co., The, LaCrosse, Wis.
U. S. Engineering & Mfg. Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

HUMIDIFIERS, DIRECT, SPRAY HEAD

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Cleveland, N. C.
Anetsberger Bros., Inc., Northbrook, Ill.
Bahnson Co., Winston-Salem, N. C. (Centrifugal)
Binks Mfg. Co., Chicago, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Grinnell Co., Inc., Providence, R. I.
HERRmidifier Co., Lancaster, Pa.
Lennox Industries, Inc., Marshalltown, Ia.
Maid-O'-Mist, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Murray Mfg. Co., D. J., Wausau, Wis.
Parks-Cramer Co., Fitchburg, Mass.
R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.
Roberson, Inc., Seattle, Wash.
Ross Sprinkler Co., Rosemead, Calif.
Spray Engineering Co., Burlington, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.

HUMIDIFIERS FOR RADIATORS AND CONVECTORS

Maid-O'-Mist, Inc., Chicago, Ill.

HUMIDIFIERS, RADIATOR VENT VALVE

G & H Mfg. Co., Philadelphia, Pa.
Maid-O'-Mist, Inc., Chicago, Ill.

HUMIDIFIERS, UNIT, ROOM TYPE

(Without Heating)

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Cleveland, N. C.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem N. C.
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Fresh'nd-Aire Co., Div. of Corey Corp., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
HERRmidifier Co., Lancaster, Pa.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Murray Mfg. Co., D. J., Wausau, Wis.
Research Products Corp., Madison, Wis.
Skuttle Mfg. Co., Milford, Mich.
Spraying Systems Co., Bellwood, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Swan Humidifier Co., Ballston Spa, N. Y.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.

HUMIDIFYING RADIATORS

See Radiators, Humidifying

HUMIDISTATS

American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Cleveland, N. C.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Controls, Inc., Newton, Mass.
Parks-Cramer Co., Fitchburg, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Trerice Co., H. O., Detroit, Mich.
Universal Dynamics Corp., Arlington, Va.
Walton Laboratories, Inc., Irvington, N. J.

HUMIDITY INDICATORS

See Indicator-Controllers, Relative Humidity; Psychrometers

HUMIDITY RECORDERS

See Recorders, Humidity

HUMIDITY AND TEMPERATURE CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

HYDRAULIC CLUTCHES

See Drives, Fluid or Hydraulic, for Power Transmission

HYDRAULIC PIPE PUSHERS

See Pushers, Pipe, Hydraulic

HYDRAULIC SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling

HYGROMETERS

Abbeon Supply Co., Jamaica, N. Y.
Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Cleveland, N. C.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
EPIC, Inc., New York, N. Y.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Evanston, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
Green Instruments, Inc., Henry J., Westbury, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Instruments Corp., Freeport, L. I., N. Y.
Will Corp., Rochester, N. Y.

HYGROSTATS

See Humidistats

IDENTIFICATION MARKERS (For Piping Services)

Acromark Co., Elizabeth, N. J.
Brady Co., W. H., Milwaukee, Wis. (self-sticking)
Chase Brass & Copper Co., Waterbury, Conn.
Green Instrument Co., Inc., Cambridge, Mass.
Markal Co., Chicago, Ill.
Meyercord Co., The, Chicago, Ill. (for piping service)
North Shore Nameplate Inc., Bayside, N. Y. (also for wiring and conduit systems)
Pee Cee Tape & Label Co., Los Angeles, Calif.
Seton Name Plate Co., New Haven, Conn.
Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.
Wilmington Plastics Co., Wilmington, Del.
Zaco Laboratories, Cleveland, O.

IMMERSION THERMOSTATS

See Thermostats, Immersion

INCINERATORS, FOR LARGE BUILDINGS

American Engineering Co., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Flynn & Emrich Co., Baltimore, Md. (stoker type)
Goder, Inc., Joseph, Chicago, Ill.
Goder Incinerator Corp., Blue Island, Ill.
Harmond Company, Cleveland, O.
Incinerator Products Co., Detroit, Mich.
Morse Boulger Destructor Co., New York.
Plibrico Co., Chicago, Ill.
Silent Glow Oil Burner Co., Hartford, Conn.
Syrall Mfg. Co., Syracuse, N. Y.
Winnen Incinerator Co., Bedford, O.

INDICATING THERMOMETERS

See Thermometers, Indicating

INDICATOR-CONTROLLERS, PRESSURE

Aircraft Porous Media, Inc., Glen Cove, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Assembly Products, Inc., Chesterland, O.
Automatic Control Co., St. Paul, Minn.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Davis Regulator Co., Chicago, Ill.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Daytronic Corp., Dayton, O.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif. (mechanical)
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.

Moore Products Co., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schaevitz Engineering, Camden, N. J.
Scientific Instrument Co., Detroit, Mich.
Sostman & Co., H. E., Cranford, N. J.
Swartwout Fabricators, Inc., Kokomo, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I., N. Y.

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Cleveland, N. C.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Serdex, Inc., Boston, Mass.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Universal Dynamics Corp., Arlington, Va.
Weksler Instruments Corp., Freeport, L. I., N. Y.

INDICATOR-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Assembly Products, Inc., Chesterland, O.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Century Instrument Co., Detroit, Mich.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
EPIC, Inc., New York, N. Y.
Fenwal Inc., Ashland, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Testing Laboratories, Inc., Chicago.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.

Partlow Corp., The, New Hartford, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Serdex, Inc., Boston, Mass.
Swartwout Fabricators, Inc., Kokomo, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I.
West Instrument Corp., Chicago, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

INDICATORS, CARBON DIOXIDE, BOILER ROOM

For Portable CO_2 Analyzers, See Analyzers, Carbon Dioxide, Portable

Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
General Scientific Equipment Co., Philadelphia, Pa.
Hays Corp., Michigan City, Ind.
Mine Safety Appliances Co., Pittsburgh, Pa.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.

INDICATORS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pittsburgh Lectrodryer Div., McGraw-Edison Co., Pittsburgh, Pa.
Weighing & Control Components, Inc., Hatboro, Pa.

INDICATORS, FLOW

See Meters, Flow

INDICATORS, LIQUID LEVEL, BOILER AND TANK

Automatic Control Co., St. Paul, Minn.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy-Ruff Co., St. Paul, Minn.
Henry Valve Co., Melrose Park, Ill.
Instruments, Inc., Tulsa, Okla.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Magnetrol, Inc., Chicago, Ill.

Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Phillips & Co., H. A., Chicago, Ill.
Photobell Co., Inc., New York, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schaevitz Engineering, Camden, N. J.
Swift Lubricator Co., Inc., Elmira, N. Y.
Tankit Co., The, Newark, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Worner Electronic Devices, Rankin, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

INDICATORS, pH

American Instrument Co., Inc., Silver Spring, Md.
Analytical Measurements, Inc., Chatham, N. J.
Assembly Products, Inc., Chesterland, O.
Berna Corp., Garwood, N. J.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Foxboro Co., Foxboro, Mass.
Hays Corp., The, Michigan City, Ind.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Aniline Div., Allied Chemicals Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Thomas Co., Arthur H., Philadelphia, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Will Corp., Rochester, N. Y.

INDICATORS, RELATIVE HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
Andrew Technical Supply Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
El-Tronics, Inc., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Serdex, Inc., Boston, Mass.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Universal Dynamics Corp., Arlington, Va.
Universal Instrument Co., Brentwood, Md.
Walton Laboratories, Inc., Irvington, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.

INDICATORS, SMOKE

Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Philadelphia, Pa.
Cleveland Controls, Inc., Cleveland, O.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Electronics Corp. of America, Cambridge, Mass.

Fuel Watchman, Flushing, N. Y.
Gelman Instrument Co., Chelsea, Mich.
General Blower Co., Philadelphia, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., The, Michigan City, Ind.
Photobell Co., Inc., New York, N. Y.
Photomation, Inc., Bergenfield, N. J.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Worner Electronic Devices, Rankin, Ill.

INDICATORS, SOUND LEVEL

Airserco Mfg. Co., Pittsburgh, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Scott, Inc., H. H., Inst. Div., Maynard, Mass.
Simpson Electric Co., Chicago, Ill.

INDICATORS, SPECIFIC GRAVITY, REMOTE READING

Bristol Co., The, Waterbury, Conn.
Hays Corp., The, Michigan City, Ind.
Meriam Instrument Co., The, Cleveland, O.
Permutit Co., The, Div. of Pfaudler Permutit, Inc., New York, N. Y.
Petrometer Corp., Long Island City, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Schutte and Koerting Co., Buck County, Pa.
Uehling Instrument Co., Paterson, N. J.

INDICATORS, VALVE POSITION

Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Crane Co., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
General Controls Co., Glendale, Calif.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Milton Roy Co., Philadelphia, Pa.
Sostman & Co., H. E., Cranford, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Tejax Engineering Corp., Pawtucket, R. I.

INDIRECT HEATING SURFACE

See Surface, Finned, Heating

INDIRECT WATER HEATERS

See Heaters, Water, Indirect

INDUCED DRAFT FANS

See Fans, Mechanical Draft, for Boilers

INDUSTRIAL AIR CONDITIONERS

See Unitary Air Conditioners, Industrial Type

INDUSTRIAL DRYERS

See Dryers, Industrial

INJECTOR RECIRCULATORS FOR REFRIGERANTS

Phillips & Co., H. A., Chicago, Ill.

INSERTS, CONCRETE

Air-Path Products Co., Baltimore, Md.
Carpenter & Paterson, Inc., Cambridge, Mass.
Elcen Metal Products Co., Franklin Park, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Healy Ruff C.., St. Paul, Minn.
Hilti Rapid Fastening Systems, Inc., Stamford, Conn.
Industrial Tubular Equipment Co., North Hollywood, Calif.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Modern Hanger Corp., The, Cleveland, O.
Mult-A-Frame Corp., Detroit, Mich.
Phillips Drill Co., Michigan City, Ind.
Republic Steel Corp., Cleveland, O.
Rockwood Sprinkler Co., Worcester, Mass.
South Chester Corp., Southco Div., Lester, Pa.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.

INSERTS, METAL FOR PLASTIC PIPE

Pittsburgh Pipe & Coupling Co., Allison Park, Pa.

Star Tubular Products Co., Chicago, Ill.
Telsco Fittings Div., Dallas, Tex.
Union Malleable Mfg. Co., Ashland, O.

INSTANTANEOUS WATER HEATERS

See Heaters, Water, Steam, Instantaneous

INSTRUMENTS, SOLAR SENSING, FOR HEATING AND AIR CONDITIONING

Barber-Colman Co., Rockford, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Construction Specialties, Inc., Cranford, N. J.
Johnson Service Co., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.

INSTRUMENTS, TEMPERATURE MEASURING

Atkins Technical, Inc., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Hays Corp., The, Michigan City, Ind.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Pyrodyne, Inc., Los Angeles, Calif.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Republic Flow Meter Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Thermo Electric Co., Inc., Saddle Brook, N. J.

INSULATING CONCRETE

See Concrete, Insulating

INSULATION, FOR AIR CONDITIONING EQUIPMENT

American Felt Co., Glenville, Conn. (felt)
Foamade Industries, Oak Park, Mich.
Lockport Mills, Inc., Lockport, N. Y.

INSULATION ANCHORS AND ADHESIVES

See Fasteners, Insulation

INSULATION, BOILER, TANK, AND EQUIPMENT

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Air-O-Plastik Corp., Union City, N. J.
American Hair & Felt Co., Chicago, Ill.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa. (mineral wool blankets, monoblock, super powerhouse cement, #1 cement)
Bigelow Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Dow Chemical Co., The, Midland, Mich.
Eagle-Picher Co., Cincinnati, O.
Emjay Maintenance Engineers, Rutherford, N. J.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Kaylo Div., Owens-Corning Fiberglas Corp., New York, N. Y.
Keasbey Co., Robert A., New York, N. Y. (industrial rock wool reinforced with wire)
Keasbey & Mattison Co., Ambler, Pa.
Lockport Mills, Inc., Lockport, N. Y.
MMM, Inc., Houston, Tex. (low temperature)
Monsanto Chemical Co., St. Louis, Mo. (silica aerogel)
Mundet Cork Corp., North Bergen, N. J. (Cork)
National Cork Co., Englewood, N. J. (Corkboard)
Nicolet Industries, Inc., Hamilton, O. (asbestos)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos and magnesia)
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., New York, N. Y. (block or board)
Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., San Francisco, Calif. (85% magnesia; calcium silicate; high temperature)
Pacific Lumber Co., The, San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif. (cork, hair felt)
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O. (mineral wool)
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y. (cork)
Reflectal Corp. Subsidiary, Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Blanket, block, cement)
Robinson Industries, Coleman, Mich. (expanded plastic)
Ruberoid Co., New York, N. Y. (Asbestos, calsilite)
Smith & Kanzler Corp., Linden, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif.
Tufflite Plastics, Inc., Ballston Spa, N. Y. (low temp.)
United Cork Co., Kearney, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J. (loose wool)
Walker Jamar Co., Duluth, Minn.
Zonolite Co., Chicago, Ill. (plastic)

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Rock wool)
Alumiseal Corp., New York, N. Y. (reflective)
American Flange & Mfg. Co., Inc., New York, N. Y. (Metal sheets)
Armstrong Cork Co., Lancaster, Pa. (Corkboard, fibre board, rigid foamed plastic board)
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa. (spun mineral wool blankets)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Rock wool loose, batts)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Rock wool)
Carney Co., Inc., The, Mankato, Minn. (blankets; loose fill)
Celotex Corp., The, Chicago, Ill. (flexible, semi-rigid, and rigid)
Chamberlin Co. of America, Detroit, Mich.
Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y. (vapor barrier materials for insulation)
Dow Chemical Co., The, Midland, Mich.
Dyfoam Corp., Newcastle, Pa. (foamed polystyrene)
Eagle-Picher Co., Cincinnati, O. (Loose, fill, batt and granulated)
Emjay Maintenance Engineers, Rutherford, N. J.
Flintkote Co., The, New York, N. Y. (glass wool)
Forest-Wool Insulation Co., Inc., Marshall, Mich. (blown and blanket cellulose)
Forty-Eight Insulations, Inc., Aurora, Ill. (wool batts)
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Infra Insulation, Inc., West Nyack, N. Y. (parallel and accordion—reflective, asbestos)
Insul-Cell Mfg. Co., Muncie, Ind. (cellulose fibre)
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (wood fibre)
Insul-Wool Insulation Co., St. Louis, Mo. (cellulose)
International Vermiculite Co., Girard, Ill. (Loose fill)
Johns-Manville, New York, N. Y.
Johnston Foil Mfg. Co., St. Louis, Mo. (Foil, aluminum, tin, lead)
Kaylo Div., Owens-Corning Fiberglas Corp., New York, N. Y. (block type)
Lockport Mills, Inc., Lockport, N. Y.
Mearlcrete Div., Mearl Mfg. Corp., Roselle Park, N. J. (roof fill, floor fill, perimeter)

Minnesota & Ontario Paper Co., Insulite Div., Minneapolis, Minn.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y. (mineral wool, perimeter insulation)
Nelson Mfg. Co., B. F., Minneapolis, Minn.
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., New York, N. Y. (batts or blankets)
Pacific Lumber Co., The, San Francisco, Calif.
Pal-O-Pak Insulation Co., Inc., Hartland, Wis. (loose fill, cellulose)
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plastergon Wall Board Co., Buffalo, N. Y. (Rigid board)
Poe Co., C. W., Cleveland, O. (mineral wool)
Rector Mineral Trading Corp., New York, N. Y. (cork)
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Rock, slag wool)
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y. (foil)
Reynolds Metals Co., Richmond, Va.
Richkraft Co., Chicago, Ill. (reflective)
Robinson Industries, Coleman, Mich. (expanded plastic)
Rubatex Div., Great American Industries, Inc., Bedford, Va. (low temperature)
Ruberoid Co., New York, N. Y.
Schlegel Mfg. Co., Rochester, N. Y. (for weather-stripping doors & windows)
Silvercote Products, Inc., Chicago, Ill.
Sprayo-Flake Co., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hairfelt)
Tennessee Products and Chemical Corp., Nashville, Tenn.
Thiokol Chemical Corp., Trenton, N. J. (foaming resins)
United Cork Companies, Kearny, N. J. (Cork)
United States Gypsum Co., Chicago, Ill. (Wool and USG Ins. board)
United States Mineral Wool Co., Stanhope, N. J. (Mineral wool, granulated wool, loose wool)
United States Pipe & Foundry Co., Birmingham, Ala. (mineral wool-batts and pellets)
Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill. (Loose fill)

INSULATION, DUCT, SOUND DEADENING

For Application Inside Duct

American Felt Co., Glenville, Conn. (felt)
American Hair & Felt Co., Chicago, Ill.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Celotex Corp., The, Chicago, Ill.
Emjay Maintenance Engineers, Rutherford, N. J.
Felters Company, The, Boston, Mass. (wool felt)
General Sound Control, Inc., Hollydale, Calif. (prefabricated)
Grant Wilson, Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Insul-Coustic, Inc., Maspeth, Long Island, N. Y.
Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn. (wood fibre)
Inter-Coastal Paint Corp., East St. Louis, Ill.
Johns-Manville, New York, N. Y. (mineral wool)
Keasbey & Mattison Co., Ambler, Pa.
Lockport Mills, Inc., Lockport, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J. (glass fibre)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Owens-Corning Fiberglas Corp., New York, N. Y. (flexible or board)
Rector Mineral Trading Corp., New York, N. Y. (cork)
Silvercote Products, Inc., Chicago, Ill.
Sound Reduction Corp., East Hartford, Conn. (sound absorbers)
Sprayo-Flake Co., Chicago, Ill.
Thompson and Co., Oakmont, Pa.

Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill.

INSULATION, DUCT, THERMAL

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Asbestos)
American Flange & Mfg. Co., Inc., New York, N. Y.
American Hair & Felt Co., Chicago, Ill. (Hair felt)
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (Corkboard)
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa. (semi-rigid mineral wool)
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos)
Celotex Corp., The, Chicago, Ill.
Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y. (prefab polyvinyl duct covering)
Dow Chemical Co., The, Midland, Mich.
Dyfoam Corp., Newcastle, Pa. (foamed polystyrene)
Eagle-Picher Co., Cincinnati, O. (Mineral wool blankets)
Emjay Maintenance Engineers, Rutherford, N. J.
Felters Company, The, Boston; Mass. (Wool felt)
Flintkote Co., The, New York, N. Y. (fibrated, asphalt spray on)
Forty-Eight Insulations, Inc., Aurora, Ill. (rigid board)
Grant Wilson, Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (aluminum)
Infra Insulation, Inc., West Nyack, N. Y.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wood fibre)
Insul-Mastic Corp. of America, Summit, Ill.
International Vermiculite Co., Girard, Ill. (Block)
Johns-Manville, New York, N. Y. (Mineral wool)
Kaylo Div., Owens-Corning Fiberglas Corp., New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (Asbestos)
Lockport Mills, Inc., Lockport, N. Y.
Lynch Asbestos Co., Los Angeles, Calif. (asbestos & foil aircells)
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J. (Cork)
National Cork Co., Englewood, N. J. (Corkboard)
Nicolet Industries, Inc., Hamilton, O. (asbestos)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos and wool felt)
Owens-Corning Fiberglas Corp., New York, N. Y. (Blanket or board)
Pabco Industrial Insulations Div., **Fibreboard Paper Products Corp., San Francisco, Calif.** (85% magnesia)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Plasti-Foam Corp., Hoboken, N. J. (expanded polystyrene)
Poe Co., C. W., Cleveland, O. (mineral wool)
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y. (cork)
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Mineral wool blanket)
Reynolds Metals Co., Richmond, Va.
Rubatex Div., Great American Industries, Inc., Bedford, Va. (rubber)
Ruberoid Co., New York, N. Y. (Asbestos cellular and laminated sheets or blocks)
Silvercote Products, Inc., Chicago, Ill.
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell type)
Sprayo-Flake Co., Chicago, Ill.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hair felt)
Star Woolen Co., Cohoes, N. Y. (nylon)

Taft Jenkins Co., Inc., Holyoke, Mass.
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif. (blanket type)
Tufflite Plastics, Inc., Ballston Spa, N. Y. (low temp.)
United Cork Companies, Kearny, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J.
Wood Conversion Co., St. Paul, Minn.

INSULATION FASTENERS AND ANCHORS

See Fasteners, Insulation

INSULATION, FINISHING CEMENT

Acme Asbestos Covering & Floor Co., Chicago, Ill. (magnesia; air cell woolfelt)
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Eagle-Picher Co., Cincinnati, O.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Moore Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., N. Bergen, N. J. (mineral wool)
National Cork Co., Englewood, N. J.
Nicolet Industries, Inc., Hamilton, O. (asbestos)
North American Asbestos Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Ruberoid Co., New York, N. Y. (asbestos)
St. Clair Rubber Co., Detroit, Mich.
Standard Asbestos Mfg. Co., Chicago, Ill.
United States Mineral Wool Co., Stanhope, N. J.
Urethane Foam Div., Rainbow Industries, Inc., Butler, Pa.

INSULATION, PIPE, AND TUBING

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (magnesia)
American Hair & Felt Co., Chicago, Ill.
Armstrong Contracting & Supply Corp., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (Cork, flexible foamed plastic)
Atlas Mineral Products Co., Mertztown, Pa.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa. (mineral wool; #100 & #101 pipe covering; 85% magnesia pipe insulation, calcium silicate pipe insulation)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos, magnesia)
Delaware Insulation Co., Wilmington, Del. (urethane)
Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y. (prefab polyvinyl pipe insulation and finish)
Dow Chemical Co., The, Midland, Mich.
Dyfoam Corp., Newcastle, Pa. (foamed polystyrene)
Eagle-Picher Co., Cincinnati, O. (Mineral wool)
Forty-Eight Insulations, Inc., Aurora, Ill.
General Aluminum Supply Co., Kansas City, Mo.
Glo-Brite Products, Inc., Chicago, Ill.
Goodrich Co., B. F., Shelton, Conn. (cellular rubber)
Grant Wilson, Inc., Chicago, Ill. (85% magnesium, air-cell, woolfelt, anti-sweat, frost proof, sponge felt.)
Gustin-Bacon Mfg. Co., Kansas City, Mo. (Molded fine glass fiber)
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (reflective)
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Infra Insulation, Inc., West Nyack, N. Y.
Insul-Mastic Corp. of America, Summit, Ill. (asphalt-cork)
International Vermiculite Co., Girard, Ill.
Jarrow Products, Inc., Chicago, Ill. (sponge tubing)
Johns-Manville, New York, N. Y.
Kaylo Div., Owens-Corning Fiberglas Corp., New York, N. Y.
Keasbey Co., Robert A., New York, N. Y. (Asbestos and cork) (hair felt on cold side)

Keasbey & Mattison Co., Ambler, Pa. (Asbestos, calcium silicate)
Lockport Mills, Inc., Lockport, N. Y.
MMM, Inc., Houston, Tex. (low temperature)
Met-L-Wood Corp., Chicago, Ill. (composition material faced with sheet metal)
Minnesota Mining & Mfg. Co., St. Paul, Minn. (Spray)
Mortell Co., J. W., Kankakee, Ill. (plastic cork)
Mundet Cork Corp., North Bergen, N. J. (85% magnesia, calcium silicate, 100% pure cork)
Mystik Adhesive Products, Inc., Chicago, Ill.
National Cork Co., Englewood, N. J. (Cork)
Nicolet Industries, Inc., Hamilton, O. (Asbestos)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos, magnesia)
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., New York, N. Y. (perforated or flexible)
Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., San Francisco, Calif. (85% magnesia; calcium silicate; high temperature)
Pacific States Felt Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland O. (mineral wool)
Presstite Div., American-Marietta Co., St. Louis, Mo. (tape)
Rector Mineral Trading Corp., New York, N. Y. (cork)
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill. (foil and corrugated paper)
Rhopac, Inc., Skokie, Ill.
Robinson Industries, Coleman, Mich. (expanded plastic)
Rubatex Div., Great American Industries, Inc., Bedford, Va. (rubber)
Ruberoid Co., New York, N. Y. (Asbestos, calsilite)
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell, wool felt and hair felt)
Spring Packing Corp., Chicago, Ill. (asphaltic)
Standard Asbestos Mfg. Co., Chicago, Ill.
Surface Chemicals, Inc., McKees Rocks, Pa.
Taft Jenkins Co., Inc., Holyoke, Mass.
Tufflite Plastics, Inc., Ballston Spa, N. Y. (low temp.)
United Cork Companies, Kearny, N. J.
Uni-Crest Div., United Cork Companies, Kearny, N. J.
United States Rubber Co., New York, N. Y. (asbestos)
Virginia Smelting Co., West Norfolk, Va.
Walker Jamar Co., Duluth, Minn.
Wood Conversion Co., St. Paul, Minn.
Zippertubing Co., Los Angeles, Calif.

INSULATION, PIPE, UNDERGROUND

American Gilsonite Co., Salt Lake City, Utah
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Dow Chemical Co., The, Midland, Mich.
Durant Insulated Pipe Co., E. Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Cleveland, O.
Insul-Fil Co., Inc., Div. Miracle Adhesives Corp., Bellmore, Long Island, N. Y.
Mearlcrete Div., Mearl Mfg. Corp., Roselle Park, N. J.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Owens-Corning Fiberglas Corp., New York, N. Y.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Porter & Co., Inc., H. W., Newark, N. J.
Ric-wiL, Inc., Barberton, O. (hot or cold)
Robinson Industries, Coleman, Mich. (expanded plastics)
Tufflite Plastics, Inc., Ballston Spa, N. Y. (low temp.)
Williamson, Inc., T. D., Tulsa, Okla.
Ziegler & Co., G. S., Great Neck, N. Y.

INTAKES FOR OUTDOOR AIR, WALL OR ROOF, EQUIPPED WITH FILTERS

Muckle Mfg. Co., Owatonna, Minn.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Titus Mfg. Corp., Waterloo, Ia.

IONIZATION APPARATUS

Cochrane Corp., Philadelphia, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Ionaire, Inc., San Francisco, Calif.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J. (negative ion producers)

IRON BODY VALVES

See Valves, Gate; and Valves, Globe

ISOTOPES, RADIOACTIVE, FOR DETECTING LEAKS IN PIPING AND HEATING SYSTEMS

American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.
Tracerlab, Inc., Waltham, Mass.

JACKETED PIPE

See Pipe, Jacketed

JACKETING FOR PIPE INSULATION

See Protectors, Pipe Covering

JETS, OVERFIRE AIR, FOR SMOKE ABATEMENT

Auburn Foundry, Inc., Heating Div., Auburn, Ind.
Canton Stoker Corp., Canton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
McNeill Smoke Eliminator Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.

JOINTS, PIPE, ELECTRICAL INSULATING

Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Epco Sales, Inc., Cleveland, O.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Union Malleable Mfg. Co., Ashland, O.
Universal Controls Corp., Dallas, Tex.

JOINTS, PIPE, EXPANSION, FOR BASEBOARD HEATING

American Tube Products, Inc., West Warwick, R. I.
Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Beacon Brass Co., Waltham, Mass.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hoffman Specialty Mfg. Corp., Indianapolis.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Kopperman & Sons, Inc., Joseph, Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Zallea Brothers, Wilmington, Del.

JOINTS, PIPE, EXPANSION, PACKLESS, METAL

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
American Boa, Inc., New York, N. Y.
American Flow Control Corp., Houston, Tex.
Anaconda Metal Hose Div., The American Brass Co., Waterbury, Conn.
Badger Fire Extinguisher Co., Methuen, Mass.
Badger Mfg. Co., Cambridge, Mass.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Flexrock Co., Philadelphia, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Harris & Co., Arthur, Chicago, Ill.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Kopperman & Sons, Inc., Joseph, Philadelphia, Pa.
Marquette Coppersmithing Co., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ric-wiL, Inc., Barberton, O.
Rotherm Engineering Co., Inc., Chicago, Ill.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Solar Aircraft Co., San Diego, Calif.
Techniflex Div., Port Jervis, N. Y.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Zallea Brothers, Wilmington, Del.

JOINTS, PIPE, EXPANSION, PACKLESS, PLASTIC

Belmont Packing & Rubber Co., Philadelphia, Pa.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Garlock Packing Co., The, Palmyra, N. Y. (teflon)
United States Gasket Co., Camden, N. J.

JOINTS, PIPE, EXPANSION, PACKLESS, RUBBER

American Flow Control Corp., Houston, Tex.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y. (spool type & U type)
General Rubber Corp., Tenafly, N. J.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Mercer Rubber Co., Hamilton Sq., N. J.
Raybestos-Manhattan, Inc., Passaic, N. J.
Saussé & Co., M. W., Los Angeles, Calif.
United States Rubber Co., New York, N. Y.
Vibration Mountings, Inc., Corona, N. Y.

JOINTS, PIPE, EXPANSION, SLIP

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
American Flow Control Corp., Houston, Tex.
Badger Fire Extinguisher Co., Methuen, Mass.
Baker & Co., R. H., Los Angeles, Calif.
Clow & Sons, Inc., James B., Chicago, Ill.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Powell Co., Wm., Cincinnati, O.
Q-P Mfg. Co., Needham Heights, Mass.
Rotherm Engineering Co., Inc., Chicago, Ill.
Royalton Co., Inc., Gasport, N. Y.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Smith-Blair, Inc., S. San Francisco, Calif.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded UPVC)
Walworth Co., New York, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.
Zurn Industries, Inc., Erie, Pa.

JOINTS, PIPE, FLEXIBLE, SWING AND REVOLVING

Barco Mfg. Co., Barrington, Ill.
Bordo Co., Inc., L. J., Glenside, Pa.
Chiksan Co., Brea, Calif.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexo Supply Co., Inc., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Marman Div., Aeroquip Corp., Los Angeles, Calif.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
OPW-Jordan, Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Powell Co., Wm., Cincinnati, O.
Rotherm Engineering Co., Inc., Chicago, Ill.
Sealol Corp., Providence, R. I.
Seamlex Co., Inc., Long Island City, N. Y.
Spincraft, Inc., Milwaukee, Wis.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.

JOINTS, UNIVERSAL, FOR OPERATING VALVES

Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Brooks Equipment Corp., Hoboken, N. J.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clark Flexible Link Shaft Co., Newton Highlands, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Piezo Mfg. Corp., Staten Island, N. Y.
Stow Mfg. Co., Binghamton, N. Y.

KATA THERMOMETERS

See Thermometers, Kata

KITS, COMBUSTION TESTING

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
G. M. Mfg. Co., New York, N. Y.
Hays Corp., Michigan City, Ind.
Victory Engineering Corp., Union, N. J.

KITS, REPAIR FOR PIPES, TANKS, VALVES, FLANGES, AND DUCTS

Arco Products, Automotive Rubber Co., Detroit, Mich.
Chemical Coatings & Engineering Co., Media, Pa.
Devcon Corp., Danvers, Mass.

LACQUERS

See Enamels and Lacquers

LAGGING ADHESIVES

See Adhesives, for Pipe Covering

LAMPS, STERILIZING, FOR DUCT INSTALLATION

Cooper Hewitt Electric Co., Div. of Sperti-Faraday, Inc., Hoboken, N. J.
Fuller Co., D. William, Chicago, Ill.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland, O.
Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.
Sampson Scientific Co., Div. of the Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti Faraday, Inc., Hoboken, N. J.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

LEAD PIPE

See Pipe and Tubing, Lead and Lead Alloy

LEAD SHEETS

See Sheets, Lead

LEAD TUBING

See Pipe and Tubing, Lead and Lead Alloy

LEAK DETECTORS

See Detectors, Leak, Refrigerant; Detectors, Leak, Underground Piping; Isotopes, Radioactive

LEATHER PACKING

See Packing, Leather

LIFT GATES AND LIFT TRUCKS

See Gates, Lift; Trucks, Lift

LIGHTS, PILOT AND SIGNAL

Allen-Bradley Co., Milwaukee, Wis.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dialight Corp., Brooklyn, N. Y.
Furnas Electric Co., Batavia, Ill.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland, O.
General Electric Co., Wiring Device Dept., Providence, R. I.
Hart Mfg. Co., The, Hartford, Conn.
Hubbell Corp., Mundelein, Ill. (for solenoid valves)
Kulka Electric Corp., Mt. Vernon, N. Y.
Pyle-National Co., The, Chicago, Ill.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

LINE-UP PINS FOR FLANGES

See Pins, for Flange Line-Up

LININGS, TANK

Amercoat Corp., South Gate, Calif.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Argo Plastic Products, Cleveland, O.
Atlas Mineral Products Co., Mertztown, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bishopric Products Co., Cincinnati, O.
Caldwell Co., W. E., Louisville, Ky.
Carboline Co., The, St. Louis, Mo.
Chemical Coatings & Engineering Co., Media, Pa.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (plastic)
Corite Products, Inc., Chicago, Ill. (plastic)
Corrosion Control Co., Inc., New York, N. Y.
Elastic Porcelain Lining Corp., Rochester, N. Y.
Ellicott Fabricators, Inc., Baltimore, Md.
Emjay Maintenance Engineers, Rutherford, N. J.
Gates Engineering Co., Wilmington, Del.
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (Pure phenolic baking type; synthetic rubber, sheet and liquid)
Industrial Filter & Pump Co., Cicero, Ill.
Interchemical Corp., Finishes Div., Newark, N. J.
Kaykor Industries, Inc., Yardville, N. J.
Knapp Mills, Inc., Long Island City, N. Y. (lead)
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lithcote Corp., Melrose Park, Ill.
Mercer Rubber Co., Hamilton Sq., N. J.
Metalweld, Inc., Industrial Maintenance Div., Philadelphia, Pa.
Metal & Thermit Corp., Rahway, N. J.
Nazar Rubber Co., Toledo, O.
Norwood Associated Engineers, Inc., Springfield, Mass.
Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa. (cement)
Porce-Lin Tank Lining Co., Detroit, Mich.
Quelcor, Inc., Chester, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Steelcote Mfg. Co., St. Louis, Mo.
United States Rubber Co., New York, N. Y.
Wagner Bros., Inc., Equipment Div., Detroit, Mich.
Wilbur & Williams Co., Norwood, Mass. (acid caustic band tank lining system)

LINKS, FUSIBLE

Bar-Brook Mfg. Co., Inc., Shreveport, La.
Grinnell Co., Inc., Providence, R. I.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Morse-Smith-Morse Co., Watertown, Mass.
Preferred Utilities Mfg. Corp., New York, N. Y.

LIQUID AFTERCOOLERS

See Aftercoolers, for Hot Liquids

LIQUID LEVEL GAGES

See Gages, Liquid Level

LIQUID LEVEL INDICATORS

See Indicators, Liquid Level

LIQUID LEVEL RECORDERS

See Recorders, Liquid Level

LIQUID LEVEL REGULATORS

See Regulators, Liquid Level

LIQUID PRESSURE REGULATORS

See Regulators, Pressure, Liquid

LOCATORS, PIPE, WALL AND UNDERGROUND

Fisher Research Laboratory, Inc., Palo Alto, Calif.
Gardiner Electronics Co., Phoenix, Ariz.
Wilkinson Products Co., Pasadena, Calif.

LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

LOCK NUTS

See Nuts, Lock

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Acme Engineering & Mfg. Corp., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Conditioning Products Co., Detroit, Mich.
Airjet Ventilator Co., San Clemente, Calif.
Airmaster Corp., Chicago, Ill.
Airolite Co., Marietta, O.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
American Steel Band Co., Pittsburgh, Pa.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., Inc., Stillwater, Minn.
Arex Co., Chicago, Ill.
Atcor, Inc., Warren, Mich.
Barber-Colman Co., Rockford, Ill.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Belco Industries, Inc., St. Louis, Mo.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Brisk Metal Products, Ridgefield, N. J.
Bowman Steel Corp., Pittsburgh, Pa.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Cain Mfg. Inc., Birmingham, Ala.
Champion Blower & Forge Co., Lancaster, Pa.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Colt Ventilation of America, Inc., Los Angeles, Calif.
Commercialaire Corp. of America, Brooklyn, N. Y.
Construction Specialties, Inc., Cranford, N. J.
Controlair Mfg. Co., Los Angeles, Calif.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Detroit Float & Stamping Co., Detroit, Mich.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
Imperial Damper Co., New York, N. Y.
Independent Register Co., Cleveland, O.
International Engineering, Inc., Dayton, O.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Maple City Furnace Co., Monmouth, Ill.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric, Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Palmer Fan Div., Palmer Engineering Co., Green Bay, Wis.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Reed Unit-Fans, Inc., New Orleans, La.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Senrac Industries, Madison, Wis.

Standard Stamping & Perforating Co., Chicago, Ill.
Swartwout Fabricators, Inc., Kokomo, Ind.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United Sheet Metal Co., Inc., Columbus, O.
United States Gypsum Co., Chicago, Ill.
United States Register Co., Battle Creek, Mich.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Ventilouvre Co., Inc., The, Marietta, O.
Whirlwind Mfg. Co., Houston, Tex.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Young Regulator Co., Cleveland, O.

LOUVERS, SUN REFLECTING
American Warming & Ventilating Co., Toledo, O.
Brisk Metal Products, Ridgefield, N. J.
Construction Specialties, Inc., Cranford, N. J.
Kewaneer Co., Niles, Mich.
Knapp Bros. Mfg. Co., Cincinnati, O.
Lemlar Mfg. Co., Gardena, Calif.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.

LOW WATER CUT-OFFS
See Cut-offs, Low Water, Heating Boiler

LUBRICANTS, VALVE STEM
Armite Laboratories, Los Angeles, Calif.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Electrofilm, Inc., N. Hollywood, Calif.
Fairchild Camera & Instrument Corp. of Syosset, Long Island, N. Y.
Gulf Oil Corp., Pittsburgh, Pa.
Jet-Lube, Inc., Burbank, Calif.
Smith Chemical Co., E. W., La Puente, Calif.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.

MACHINES, BALANCING
See Equipment, Balancing

MACHINES, BLUE PRINT AND WHITE PRINT
For Reproducing Engineering Drawings
American Photocopy Equipment Co., Chicago, Ill. (for photocopy work)
Bruning Co., Inc., Charles, Mt. Prospect, Ill.
Dietzgen Co., Eugene, Chicago, Ill.
Ozalid Div. of General Aniline & Film Corp., Johnson City, N. Y.
Paragon-Revolute Corp., Rochester, N. Y.
Pease Co., C. F., The, Chicago, Ill.
Reproduction Engineering Corp., Essex, Conn.

MACHINES, ENGRAVING, FOR IDENTIFICATION OF PIPING EQUIPMENT
Acromark Co., Elizabeth, N. J.
New Hermes Engraving Machine Corp., New York, N. Y.
Preis Engraving Machine Co., H. P., Hillside, N. J.

MACHINES AND FILM, X-RAY
Balteau Electric Corp., Stamford, Conn.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington, Del. (film only)
General Electric Co., X-Ray Dept., Milwaukee, Wis.
Keleket X-Ray Corp., Waltham, Mass.
Mitchell Radiation Products Corp., Norristown, Pa.
Philips Electronics, Inc., Mt. Vernon, N. Y.
Picker X-Ray Co., White Plains, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

MACHINES, FLARING, PIPE AND TUBE
Chicago Pneumatic Tool Co., New York.
Hill, Inc., Walter P., Detroit, Mich.
Leonard Precision Products Co., Santa Ana, Calif.
Wilson Co., K. R., Arcade, N. Y.

MACHINES, PIPE CLEANING
Continental Machine Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hydraulic Mfg. Co., Bridgeport, Conn.
Narda Ultrasonics Corp., Westbury, Long Island, N. Y. (ultrasonic)

Oster Mfg. Co., The, Wickliffe, O.
Plicoflex Inc., Los Angeles, Calif.
Spartan Tool Div., H. D. Conkey & Co., Chicago, Ill.
Wilson, Inc., Thomas C., Long Island City, N. Y.

MACHINES, PIPE CUTTING AND THREADING, PORTABLE
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
H & M Pipe Beveling Machine Co., Tulsa, Okla.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich.
Landis Machine Co., Inc., Waynesboro, Pa.
Mine Safety Appliances Co., Velocity Power Tool Dept., Pittsburgh, Pa.
Muncie Gear Wks., Inc., Muncie, Ind.
Obear & Sons, Inc., Inglewood, Calif.
Oster Mfg. Co., Wickliffe, O.
Pilot Mfg. Co., Torrance, Calif.
Ridge Tool Co., Elyria, O.
Skil Corp., Chicago, Ill.
Thread-Ezy Mfg. Co., Corunna, Mich.
Toledo Pipe Threading Machine Co.; Toledo, O.
Wachs Co., E. H., The, Chicago, Ill.

MACHINES, PIPE CUTTING AND THREADING, STATIONARY
Beaver Pipe Tools, Inc., Warren, O.
Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Krieg, Inc., Victor J., New York, N. Y.
Landis Machine Co., Inc., Waynesboro, Pa.
Obear & Sons, Inc., Inglewood, Calif.
Oster Mfg. Co., Wickliffe, O.
Pilot Mfg. Co., Torrance, Calif.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

MACHINES, PIPE, FOR WELDING, CUTTING, AND FITTING
Beaver Pipe Tools, Inc., Warren, O.
H & M Pipe Beveling Machine Co., Tulsa, Okla.
Peck & Co., Cecil C., Cleveland, O.
Porter Co., R. C., Cincinati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.
Wachs Co., E. H., The, Chicago, Ill.

MACHINES, PITTSBURGH LOCK FORMING
Bell Machine Specialties, Trevose, Pa.
Birks Mfg. Co., Meridan, Conn. (Pittsburgh lock seam opener)
Lockformer Co., Chicago, Ill.
Maplewood Div., Rockford Machine Tool Co., Rockford, Ill.
Millers Falls Co., Greenfield, Mass.
Milton Equipment Co., Philadelphia, Pa. (sheet metal working machine)
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Speed-Seam Co., Chicago, Ill.

MACHINES, REFRIGERATION, ABSORPTION
Arkla Air Conditioning Corp., Little Rock, Ark.
Carrier Corp., Syracuse, N. Y.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

MACHINES, SLIP ROLL FORMING
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Hendley & Whitmore Co., Beloit, Wis.
Maplewood Div., Rockford Machine Tool Co., Rockford, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
San Angelo Foundry & Machine Co., San Angelo, Tex.

Webb Corp., The, Webb City, Mo.
Wysong & Miles, Inc., Greensboro, N. C.

MACHINES, TESTING, WELD
Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Dillon & Co., Inc., W. C., Van Nuys, Calif.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

MACHINES, TRENCHING, FOR PIPE LINES
Auburn Machine Works, Inc., Auburn, Nebr.
Clipper Mfg. Co., Kansas City, Mo.
Davis Mfg. Inc., Wichita, Kans. (portable)
Eveready Briksaw Co., Kansas City, Mo.
Parsons Co., Div. of Koehring Co., Newton, Ia.

MACHINES, TUBE FINNING
United Machinery Sales Co., Chicago, Ill.

MAGNESIUM ALLOY SHEETS
See Sheets, Magnesium Alloy

MAGNESIUM TUBING
See Tubing, Magnesium

MAKEUP AIR UNITS
See Units, Makeup Air, Heating and Ventilating, Horizontal Package Type, Direct Fired, Oil, and Gas; Units, Makeup Air, Heating and Ventilating, Package Type, Steam or Hot Water

MALLEABLE UNIONS
See Unions, Malleable

MANIFOLDS AND HEADERS, PREFABRICATED, FOR HEATING SYSTEMS
Acheson Mfg. Co., Rankin, Pa.
Atlantic Pipe Bending & Fabricating Corp., Moonachie, N. J.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Elkhart Products Corp., Elkhart, Ind.
Kenmore Machine Products, Inc., Lyons, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Panel Heat, Inc., Copiague, N. Y.
Piper Industries, Inc., Roseville, Mich.
Shaw-Kendall Engineering Co., Toledo, O.
Super Radiator Corp., Minneapolis, Minn.
Thrush & Co., H. A., Peru, Ind.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.

MANIFOLDS, REFRIGERATION
Elkhart Products Corp., Elkhart, Ind.
Frick Co., Waynesboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York.
Refrigeration Research, Inc., Brighton, Mich.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

MANOMETERS
Airserco Mfg. Co., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Dynametrics Corp., Burlington, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elgin Softener Corp., Elgin, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Arlington, Mass. (micro)
Hastings-Raydist, Inc., Hampton, Va.

Hill & Co., E. Vernon, Lake Geneva, Wis.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Washington, D. C.
Scientific Instrument Co., Detroit, Mich.
Simplex Valve & Meter Co., Lancaster, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan Inc., Belleville, N. J.
Will Corp., Rochester, N. Y.

MARKERS, PIPE, HOLE AND SADDLE

Acromark Co., Elizabeth, N. J.
Brady Co., W. H., Milwaukee, Wis.
Contour Marker Corp., Compton, Calif.
Jewel Mfg. Co., St. Paul, Minn.
Seton Name Plate Co., New Haven, Conn.

MASONRY ANCHORS

See Anchors, Expansion

MATERIALS HANDLING FANS

See Fans, Materials Handling; Units, Exhauster, Centrifugal Fan

MECHANICAL DRIVE TURBINES

See Turbines, Mechanical Drive

MECHANICAL SPEED CHANGERS

See Changers, Speed, Mechanical

MECHANICAL TRAPS

See Traps, Steam, Mechanical

MERCURY SWITCHES

See Switches, Mercury

METAL HOSE

See Hose, Flexible, Metal and Fittings

METAL, POROUS, FOR FILTRATION, SEPARATION, DIFFUSION AND FLOW CONTROL

Chemiquip Co., New York, N. Y.
Keystone Carbon Co., Inc., St. Marys, Pa.
Moraine Products Div., General Motors Corp., Dayton, O. (porous metals)
Wabash Corp., Chicago, Ill.

METALLIC BELLOWS

See Bellows, Thermostatic and Metallic

METALLIC PACKING

See Packing, Metallic

METER MANIFOLD ASSEMBLIES

See Assemblies, Manifold, for Meters

METERS, AIR VELOCITY, DIRECT READING

Anemostat Corp. of America, New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Flow Corp., Arlington, Mass.
Hastings-Raydist, Inc., Hampton, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago.
Johnson Degree Day Systems, Kalamazoo, Mich.
United Electric Controls Corp., Watertown, Mass.

METERS, BTU, FOR MEASURING FLOW AND TEMPERATURE AND CALIBRATED IN BTU OR THERMS

Air-Conditioning Equipment Corp., New York, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Cutler-Hammer, Inc., Milwaukee, Wis.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Liaison Engineering Services, Garland, Tex.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.

METERS, CONDENSATE

Central Station Steam Co., Detroit, Mich.
Hays Corp., Michigan City, Ind.
Henszey Co., **Watertown, Wis.**
L. R. P., Inc., Leicester, N. Y.
Neptune Meter Co., New York, N. Y.
Rotron Controls Corp., Woodstock, N. Y.

METERS, FLOW, GAS OR AIR

Air Conditioning Equipment Corp., New York, N. Y.
Air Products, Inc., Allentown, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Barton Instrument Corp., **Monterey Park,** Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Dahl Co., Inc., G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Arlington, Mass.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hastings-Raydist, Inc., **Hampton, Va.**
Hays Corp., Michigan City, Ind.
Herman, Shepard, Newton Upper Falls, Mass.
King Engineering Corp., Ann Arbor, Mich.
Librascope, Inc., **Commercial Div., Burbank,** Calif.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Washington, D. C.
Neptune Meter Co., **New York, N. Y.**
Oxygen Equipment & Service Co., Chicago, Ill. (oxygen)
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Rotron Controls Corp., **Woodstock, N. Y.**
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Dresher, Pa.
Simplex Valve & Meter Co., Lancaster, Pa.
Sostman & Co., H. E., Cranford, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Vector Mfg. Co., Inc., Jenkintown, Pa.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.

METERS, FLOW, REFRIGERANT

Airserco Mfg. Co., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Rotron Controls Corp., Woodstock, N. Y.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Trimount Instrument Co., Chicago, Ill.

METERS, FLOW, STEAM

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
King Engineering Corp., Ann Arbor, Mich.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Washington, D. C.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Rotron Controls Corp., Woodstock, N. Y.
Sostman & Co., H. E., Cranford, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

METERS, PROCESS LIQUID

Air Conditioning Equipment Corp., New York, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Inc., Buffalo, N. Y.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Drage Products, Inc., Union City, N. J.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Gamon Meter Div., Worthington Corp., Newark, N. J.
Granberg Gorp., Oakland, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Hetherington & Berner, Inc., Indianapolis, Ind. (jacketed)
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Rotron Controls Corp., Woodstock, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Lancaster, Pa.
Smith Corp., A. O., Milwaukee, Wis.
Sostman & Co., H. E., Cranford, N. J.
Swartwout Fabricators, Inc., Kokomo, Ind.
Trimount Instrument Co., Chicago, Ill.

METERS, VOLUME, AIR AND GAS

Airserco Mfg. Co., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.

Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Meriam Instrument Co., The, Cleveland, O.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Rotron Controls Corp., Woodstock, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Dresher, Pa.
Simplex Valve & Meter Co., Lancaster, Pa.
Uehling Instrument Co., Paterson, N. J.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.

METERS, WATER

Air Conditioning Equipment Corp., New York, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
American Moistening Co., Cleveland, N. C.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Inc., Buffalo, N. Y.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Gamon Meter Div., Worthington Corp., Newark, N. J.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Hersey-Sparling Meter Co., Dedham, Mass.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Rotron Controls Corp., Woodstock, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Worthington Corp., East Orange, N. J.

MIST COLLECTORS

See Collectors, Mist

MIXING VALVES

See Valves, Mixing, Steam and Water

MODULATING VALVES

See Valves, Radiator, Steam, and Hot Water Modulating

MOTOR BASES

See Bases, Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type; Bases, Motor Tension Adjusting

MOTOR CONTROLLERS

See Controllers and Starters, Motor

MOTOR OPERATED VALVES

See Valves, Motor Operated

MOTOR-PUMP UNITS

See Pump-Motor Units, Self-Contained

MOTOR STARTERS

See Controllers and Starters, Motor

MOTORS, COMPRESSED AIR POWERED

Airetool Mfg. Co., Springfield, O.
Binks Mfg. Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
DeVilbiss Co., The, Toledo, O.
Gardner-Denver Co., Quincy, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Leiman Bros., Inc., Newark, N. J.
Thor Power Tool Co., Aurora, Ill.

MOTORS, ELECTRIC, FRACTIONAL HP

ACEC Electric Corp., New York, N. Y.
Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Airserco Mfg. Co., Pittsburgh, Pa.
Alliance Mfg. Co., Inc., Alliance, O. (Shaded pole)
Allis Co., Louis, The, Milwaukee, Wis.
Baldor Electric Co., St. Louis, Mo.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Bluffton Electric Co., Bluffton, Ind.
Bodine Electric Co., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Century Electric Co., St. Louis, Mo.
Control Co. of America, Soreng Div., Schiller Park, Ill.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Autolite Co., Toledo, O.
Electric Motors & Specialties, Inc., Garrett, Ind.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
Fasco Industries, Inc., Rochester, N. Y.
Franklin Electric Co., Inc., Bluffton, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Haydon Co., A. W., The, Waterbury, Conn.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., Boston, Mass.
Howard Industries, Inc., Racine, Wis. (all types)
Howell Electric Motors Co., Howell, Mich.
IMC Magnetics Corp., Westbury, Long Island, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Jack & Heintz, Inc., Cleveland, O.
Kingston-Conley, Inc., Div. of the Howell Electric Motors Co., Plainfield, N. J.
Leland Ohio Electric Co., The, A Subsid. of Howell Electric Motors Co., Dayton, O.
Lima Electric Motor Co., Inc., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble Electric Corp., Gladstone, Mich.
Marco Electric Mfg. Corp., Womelsdorf, Pa.
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morrill Motors, Ft. Wayne, Ind.
National Pneumatic Co., Inc., New York, N. Y.
Newman Electric Motors, Inc., Newark, N. J.
Ohio Electric Mfg. Co., Maple Heights, O.
Packard Electric Div., General Motors Corp., Warren, O.
Portable Electric Tools, Inc., Chicago, Ill.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Redmond Co., Inc., Owosso, Mich.
Reliance Electric & Engineering Co., Cleveland, O.
Reynolds Electric Co., River Grove, Ill.
Ripley Co., Inc., Middletown, Conn.
Robbins & Myers, Inc., Springfield, O.
Small Motors, Inc., Chicago, Ill.
Smith Corp., A. O., Milwaukee, Wis.
Smith Corp., A. O., Electric Motor Div., Tipp City, O.
Speedway Mfg. Co., Div. of Thor Power Tool Co., La Grange Park, Ill.
Sterling Electric Motors, Inc., Los Angeles, Calif.
Sutton Corp., O. A., The, Wichita, Kans.
Telechron Timers and Motors, Clock & Timer Dept., General Electric Co., Ashland, Mass.
Thermador Electrical Mfg., Los Angeles.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Universal Electric Co., Owosso, Mich.
Wagner Electric Corp., St. Louis, Mo.
Wesche Engineering Co., B. A., Cincinnati, O.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOTORS, ELECTRIC, 1 HP AND OVER

ACEC Electric Corp., New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Baldor Electric Co., St. Louis, Mo.
Bell & Gossett Co., Morton Grove, Ill.
Brook Motor Corp., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Byron Jackson Pumps, Inc.., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif. (submersible)
Century Electric Co., St. Louis, Mo.
Continental Electric Co., Inc., Newark, N. J.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn. (100 hp and over)
Electric Products Co., Cleveland, O.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hertner Electric Co., The, Cleveland, O.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, O.
Imperial Electric Co., Akron, O.
Jack & Heintz, Inc., Cleveland, O.
Kingston-Conley, Inc., Div. of the Howell Electric Motors Co., Plainfield, N. J.
Kurz & Root Co., Appleton, Wis.
Leland Ohio Electric Co., The, A Subsid. of Howell Electric Motors Co., Dayton, O.
Lima Electric Motor Co., Inc., The, Lima, O.
Lincoln Electric Co., Cleveland, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble Electric Corp., Gladstone, Mich.
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Moore Co., The, Marceline, Mo. (Slow speed fan motors)
Newman Electric Motors, Inc., Newark, N. J.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Reliance Electric & Engineering Co., Cleveland, O.
Reuland Electric Co., Alhambra, Calif.
Robbins & Myers, Inc., Springfield, O.
Safety Electrical Equipment Corp., New Haven, Conn.
Smith Corp., A. O., Milwaukee, Wis.
Smith Corp., A. O., Electric Motor Div., Tipp City, O.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles.
Wagner Electric Corp., St. Louis, Mo.
Wesche Engineering Co., B. A., Cincinnati, O.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOUNTINGS, VIBRATION

See Bases, Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type

MUFFLERS, HOT GAS, FOR REFRIGERANT LINES

Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Industrial Acoustics Co., Inc., New York, N. Y.
McIntire Co., The, Livingston, N. J.
Refrigeration Research, Inc., Brighton, Mich.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

MUSHROOM HEATERS

See Heaters, Steam Jet, for Liquids

MUSHROOM VENTILATORS

See Ventilators, Mushroom

NAMEPLATES, STOCK WORDING FOR IDENTIFYING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT AND CONTROLS

Acromark Co., Elizabeth, N. J.

Atlantic Engravers, Wilmington, Vt.
Brady Co., W. H., Milwaukee, Wis. (self-bonding)
Electro Devices, Inc., Mt. Prospect, Ill.
Gray Pantograph Engraving Co., Hoboken, N. J.
Metalcraft, Inc., Mason City, Ia.
Meyercord Co., The, Chicago, Ill.
New Hermes Engraving Machine Corp., New York, N. Y. (machine for marking plastic legend plates)
North Shore Nameplate Inc., Bayside, N. Y.
Pee Cee Tape & Label Co., Los Angeles, Calif.
Seton Name Plate Co., New Haven, Conn.
Southern Name Plate Shop, New Orleans, La.

NEUTRALIZERS, ACID

See Dehydrant and Acid Neutralizer

NEUTRALIZERS, ODOR

See Adsorbers, Odor, for Duct Systems

NICKEL AND NICKEL ALLOY PIPE AND FITTINGS

See Tubing, Nickel and Alloy; Fittings, Pipe, Nickel and Nickel Alloy; Pipe, Nickel and Nickel Alloy

NICKEL AND NICKEL ALLOY SHEETS

See Sheets, Nickel and Nickel Alloy

NIPPLES, PIPE, BRASS AND COPPER

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Allen Mfg. Co., W. D., Bellwood, Ill.
American Sanitary Mfg. Co., Abingdon, Ill.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Oak Park, Ill. (also chrome plated)
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N. Y.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spanco Brass Sales, Allegan, Mich.
Star Tubular Products Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ware Coupling & Nipple Co., Ware, Mass.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, FLEXIBLE

Allied Metal Hose Co., Long Island City, N. Y.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Hauck Mfg. Co., Brooklyn, N. Y.
Johnson Metal Hose, Inc., Waterbury, Conn.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Lindy Heaters, Inc., New York, N. Y.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Techniflex Div., Port Jervis, N. Y.

Tube Turns Plastics, Inc., Louisville, Ky. (UPVC)
United States Rubber Co., New York, N. Y. (rubber)

NIPPLES, PIPE, IRON AND STEEL

Aeroquip, Inc., Van Wert, O.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Albert Pipe Supply Co., Inc., Brooklyn, N. Y.
Allen Mfg. Co., W. D., Bellwood, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Camco Fittings, Inc., North Haven, Conn.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Chicago Nipple Mfg. Co., Oak Park, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Columbus Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Ladish Co., Cudahy, Wis.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Union Malleable Mfg. Co., Ashland, O.
Victaulic Co. of America, Elizabeth, N. J.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburg, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, NICKEL AND NICKEL ALLOY

Bart Mfg. Corp., Belleville, N. J.
Camco Fittings, Inc., North Haven, Conn.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Harrison Steel Corp., Brooklyn, N. Y.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
Ladish Co., Cudahy, Wis.
Star Stainless Screw Co., Paterson, N. J.
Walworth Co., New York, N. Y.

NIPPLES, PIPE, PLASTIC

Argo Plastic Products, Cleveland, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Commercial Plastic Co., Chicago, Ill.
Fibercast Co., Sand Spring, Okla.
Grinnell Co., Inc., Providence, R. I.
Kraloy Plastic Pipe Co., Inc., Los Angeles, Calif.
Industrial Plastic Fabricators, Norwood, Mass.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Luzerne Rubber Co., Trenton, N. J.
Mannesmann—Easton Plastic Products Co., Inc., Easton, Pa. (rigid unplasticized polyvinyl chloride)
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Skyline Industries Sales, Inc., Titusville, Pa.
Sloane Mfg. Co., Sun Valley, Calif.
Star Tubular Products Co., Chicago, Ill.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (UPVC)
Vanton Pump & Equipment Corp., Hillside, N. J.
Victaulic Co. of America, Elizabeth, N. J.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, RADIATOR, SLIP AND SCREW

Crane Co., Chicago, Ill.
Fanner Mfg. Co., The, Cleveland, O.

NOISE CONTROL IN DUCTS

See Absorbers, Sound, Duct Section, Prefabricated for Noise Control In Duct Systems; Insulation, Duct, Sound Deadening

NOISE ELIMINATION FOR COOLING TOWERS

Hansson, Inc., Elof, Acoustical Div., New York, N. Y.
Industrial Acoustics Co., Inc., New York, N. Y.
Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Korfund Co., Inc., Long Island City, N. Y.
Mar-Coil Heater Co., Union City, N. J.
Midwest Noise Control, Indianapolis, Ind.
Silence, Inc., Farmingdale, N. Y.
Sound Reduction Corp., East Hartford, Conn.
Vibration Mountings, Inc., Corona, N. Y.

NOISE ELIMINATORS

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems; Bases, Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type; Hose, Flexible, Metal and Fittings; Insulation, Duct, Sound Deadening

NOZZLES, ATOMIZING

American Moistening Co., Cleveland, N. C.
Bahnson Co., Winston-Salem, N. C.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Century Engineering Corp., Cedar Rapids, Ia.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Grinnell Co., Inc., Providence, R. I.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Parks Cramer Co., Fitchburg, Mass. (Industrial humidifier)
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Burlington, Mass.
Spraying Systems Co., Bellwood, Ill.
Steinen Mfg. Co., Wm., Newark, N. J.
Supreme Electric Products Corp., Rochester, N. Y.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOODING

American Moistening Co., Cleveland, N. C.
Bahnson Co., Winston-Salem, N. C.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Delavan Mfg. Co., West Des Moines, Ia.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOW MEASURING

Able Metal Spinning & Stamping Co., Far Rockaway, N. Y.
Bailey Meter Co., Cleveland, O.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I. (open flow, inserts)
Defender Instrument & Regulator Co., Boody, Ill.
Delavan Mfg. Co., West Des Moines, Ia.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R.I.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, OIL BURNER

Benjamin Air Rifle Co., St. Louis, Mo.
Boston Machine Works Co., Lynn, Mass.
Century Engineering Corp., Cedar Rapids, Ia.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Steinen Mfg. Co., Wm., Newark, N. J.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.

NOZZLES, SPARGER, FOR TANK HEATING

Heil Process Equipment Corp., Cleveland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, SPRAY

Allen Mfg. Co., W. D., Bellwood, Ill.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Cleveland, N. C.
April Showers Co., Inc., Washington, D. C.
Austin Mfg. Corp., Austin, Tex.
Bahnson Co., Winston-Salem, N. C.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Baltimore, Md.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chain Belt Co., Milwaukee, Wis.
Clarage Fan Co., Kalamazoo, Mich.
Delavan Mfg. Co., West Des Moines, Ia.
DeVilbiss Co., The, Toledo, O.
Eddington Metal Specialty Co., Eddington, Pa.
Fluor Products Co., Santa Rosa, Calif.
General Ceramics Corp., Keasbey, N. J. (ceramic and plastic)
Grav Co., Inc., Minneapolis, Minn.
Grinnell Co., Inc., Providence, R. I. (for fire protection)
HERRmidifier Co., Lancaster, Pa.
Link-Belt Co., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill. (air operated)
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Parks-Cramer Co., Fitchburg, Mass.
Plant Engineering & Equipment Co., Elizabeth, N. J.
Plummer Spray Equipment Co., Napoleon, O.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rega Mfg. Co., Rochester, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skinner Irrigation Co., Troy, O.
Spray Engineering Co., Burlington, Mass.
Spraying Systems Co., Bellwood, Ill.
Stearns Co., N. C., Shreveport, La.
Steinen Mfg. Co., Wm., Newark, N. J.
Supreme Electric Products Corp., Rochester, N. Y.
Thermal Agency, Houston, Tex.
TOT Towers Co., Houston, Tex.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Worthington Corp., East Orange, N. J.
Yarnall-Waring Co., Philadelphia, Pa.

NUTS AND WASHERS, LOCK

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Anti-Corrosive Metal Products Co., Inc., Castleton-On-Hudson, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Clark Bros. Bolt Co., Milldale, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grip Nut Co., South Whitley, Ind.
Harper Co., H. M., Morton Grove, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
MacLean-Fogg Lock Nut Co., Chicago, Ill.
Moore Inc., Goodloe E., Danville, Ill.
Ohio Nut & Bolt Co., Berea, O.
Pheoll Mfg. Co., Inc., Chicago, Ill.
Republic Steel Corp., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
SKF Industries, Inc., Philadelphia, Pa.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Tinnerman Corp., George A., Cleveland, O.
Walworth Co., New York, N. Y.

OBSERVATION BOILER PORTS

See Ports, Observations, Boiler

ODOR ADSORBERS

See Filters, Air; Adsorbers, Odor, for Duct Systems

ODOR NEUTRALIZERS

See Adsorbers, Odors, for Duct Systems Compounds, Air Freshening

OIL BURNERS

See Burners, Oil

OIL COOLERS

See Coolers, Oil

OIL, CUTTING, PIPE

Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Beaver Pipe Tools, Inc., Warren, O.
Blue Seal Chemical Co., Roselle Park, N. J.
Chesterton Co., A. W., Everett, Mass.
Gulf Oil Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Mobil Oil Co., Inc., New York, N. Y.
Nye Tool Co., Chicago, Ill.
Obear & Sons, Inc., Inglewood, Calif.
Oster Mfg. Co., Wickliffe, O.
Ridge Tool Co., Elyria, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Shell Oil Co., Lubricants Dept., Flushing, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Suflo, Inc., Elizabeth, N. J.
Sun Oil Co., Philadelphia, Pa.
Texaco, Inc., New York, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Warren Refining & Chemical Co., The, Cleveland, O.
Whitlam Mfg. Co., J. C., Wadsworth, O.
X Laboratories, Inc., New York, N. Y.

OIL, HEAT TRANSFER

Dow Corning Corp., Midland, Mich.
Gulf Oil Corp., Pittsburgh, Pa.
Imperial Oil & Grease Co., Inc., Los Angeles, Calif.
Monsanto Chemical Co., St. Louis, Mo.
Mobil Oil Co., Inc., New York, N. Y.
Shell Oil Co., Lubricants Dept., Flushing, N. Y.
Standard Oil Co. of Indiana, Chicago, Ill.
Sun Oil Co., Philadelphia, Pa.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.

OIL, REFRIGERATION

Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Belt-Ice Corp., Seattle, Wash.
Gulf Oil Corp., Pittsburgh, Pa.
Illinois Oil Products, Inc., Rock Island, Ill.
Mobil Oil Co., New York, N. Y.
Sealed Units Parts Co., Inc., New York, N. Y.
Shell Oil Co., Lubricants Dept., Flushing, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Sun Oil Co., Philadelphia, Pa.
Texaco, Inc., New York, N. Y.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

OIL SEPARATORS

See Separators, Oil

OILER UNIT, FOR USE WITH PIPE THREADER

Ridge Tool Co., The, Elyria, O.

OILERS, FOR REFRIGERATION COMPRESSORS

Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury, Conn.
Refrigeration Devices Co., Nutley, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Trico Fuse Mfg. Co., Milwaukee, Wis.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

OILS, FOR COATING VISCOUS AIR FILTERS

Continental Air Filters Inc., Louisville, Ky.
Gulf Oil Co., Pittsburgh, Pa.
Research Products Corp., Madison, Wis.
Standard Oil Co. of California, San Francisco, Calif.
Trion, Inc., McKees Rocks, Pa.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Vortox Co., Claremont, Calif.

OIL HEATERS

See Heaters, Oil Tank, Suction Bell

OIL PREHEATERS

See Heaters, Oil Tank, Suction Bell; Preheaters, Fuel Oil; Units, Fuel Oil, Heating, Pumping and Straining

OPERATORS, DAMPER, DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cleveland Controls, Inc., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Controls, Inc., Newton, Mass.
New England Gear Works, Southington, Conn.
Optimum Control Corp., Cleveland, O.
Powers Regulator Co., Skokie, Ill.
Reid Controls, Inc., Burbank, Calif.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Markesan, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Teleflex Industrial Products, Inc., Boyertown, Pa.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

OPERATORS, VALVE, HYDRAULIC OR ELECTRIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Au-Temp-Co Corp., New York, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
BelloFram Corp., Burlington, Mass.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Cameron Iron Works, Inc., Houston, Tex.
Carter Controls, Inc., Lansing, Ill.
Cleveland Controls, Inc., Cleveland, O.

Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Corp., Sartell, Minn.
Earle Gear & Machine Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hanna Engineering Wks., Chicago, Ill.
Heat-Timer Corp., New York, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jamesbury Corp., Worcester, Mass.
Janette Electric Mfg. Co., Morton Grove, Ill.
Johnson Service Co., Milwaukee, Wis.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., El Monte, Calif.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New England Gear Works, Southington, Conn.
Optimum Control Corp., Cleveland, O.
Philadelphia Gear Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Reid Controls, Inc., Burbank, Calif.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Sparton Corp., Jackson, Mich.
Taylor Instrument Companies, Rochester.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.

OPERATORS, VALVE, REMOTE, HAND

Babbitt Steam Specialty Co., New Bedford, Mass.
Cleveland Controls, Inc., Cleveland, O.
Conoflow Corp., Subsid. of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jamesbury Corp., Worcester, Mass
Ladish Co., Cudahy, Wis.
OPW-Jordan, Cincinnati, O.
Philadelphia Gear Corp., Philadelphia, Pa.
Reid Controls, Inc., Burbank, Calif.
Stow Mfg. Co., Binghamton, N. Y.
Teleflex Industrial Products, Inc., Boyertown, Pa.

ORIFICE FLANGES

See Flanges, Orifice

ORIFICE UNIONS

See Unions, Orifice

ORIFICES, FLOW MEASURING

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Infilco, Inc., Tucson, Ariz.
Madden Corp., The, Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Phoenix Products Co., Milwaukee, Wis. **(spun metal)**
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Simplex Valve & Meter Co., Lancaster, Pa.
Taylor Instrument Companies, Rochester.
Trimount Instrument Co., Chicago, Ill.

ORIFICES, RADIATOR

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Clark-Cooper Co., Inc., CC Pump Div., Palmyra, N. J.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.

OVERFIRE AIR JETS

See Jets, Overfire Air, for Smoke Abatement

OVERHEAD VALVE OPERATORS

See Operators, Valve, Remote, Hand

OVER-PRESSURE UNLOADERS, FOR REFRIGERANTS

Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Hubbell Corp., Mundelein, Ill.

OXY-ACETYLENE WELDING

See Welding and Cutting Apparatus, Oxy-Acetylene

OXYGEN ANALYZERS

See Analyzers, Oxygen

OXYGEN PIPING AND REGULATING SYSTEMS

Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Burdette Oxygen Co. of Calif., Huntington Park, Calif.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago.
Research Vacuum Supply Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.

OZONE APPARATUS

Michael Electric Co., Inc., New Haven, Conn.
Norwood Associated Engineers Inc., Springfield, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PACKAGED HEAT PUMP UNITS

See Unit, Air Conditioning, Reverse Refrigeration Cycle

PACKAGED STEAM GENERATORS

See Boilers, Packaged Units, Heating and Process

PACKING, ASBESTOS

Abbott & Biddle Co., Philadelphia, Pa.
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (insulating panel for housing)
Chesterton Co., A. W., Everett, Mass.
Chicago Specialty Mfg. Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Felt Products Mfg. Co., Skokie, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
New York Belting & Packing Co., Passaic, N. J.
Nicolet Industries, Inc., Hamilton, O.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Q-P Mfg. Co., Needham Heights, Mass.
Raybestos-Manhattan, Inc., Passaic, N. J.
Rhopac, Inc., Skokie, Ill.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Zimmerman Packing, Cincinnati, O.

PACKING, FIBER

Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Goodall Rubber Co., Trenton, N. J.
Greene, Tweed & Co., North Wales, Pa.
Hinde & Dauch Div., West Virginia Pulp & Paper Co., Sandusky, O.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
New York Belting & Packing Co., Passaic, N. J.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Zimmerman Packing, Cincinnati, O.

PACKING, LEATHER

Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Garlock Packing Co., Palmyra, N. Y.
Graton & Knight Co., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., Camden, N. J.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Williams & Son, I. B., Dover, N. H.
Zimmerman Packing, Cincinnati, O.

PACKING, METALLIC

Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Felt Products Mfg. Co., Skokie, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Johnston Foil Mfg. Co., St. Louis, Mo.
Newage Industries, Inc., Jenkintown, Pa.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Co., New York, N. Y.
Zimmerman Packing, Cincinnati, O.

PACKING, RUBBER AND SYNTHETIC

Allpax Co., Inc., Mamaroneck, N. Y.
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Baker & Co., R. H., Los Angeles, Calif.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Chesterton Co., A. W., Everett, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Rubber Wks., Erie, Pa.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Felt Products Mfg. Co., Skokie, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gates Rubber Co., Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Greene, Tweed & Co., North Wales, Pa.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Linear Incorporated, Philadelphia, Pa. (semi-metallic, non-metallic)
Mercer Rubber Co., Hamilton Sq., N. J.
Minnesota Rubber Co., Minneapolis, Minn.
Nazar Rubber Co., Toledo, O.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Seal Co., Div. of Parker-Hannifin Corp., Cleveland, O.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Q-P Mfg. Co., Needham Heights, Mass.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rhopac, Inc., Skokie, Ill.
Rubber Products Div., Parker-Hannifin Corp., Cleveland, O.
Saran Lined Pipe Co., Ferndale, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Thermoid Co., Trenton, N. J.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
Western Felt Works, Chicago, Ill.
Zimmerman Packing, Cincinnati, O.

PAINT, HIGH TEMPERATURE, FOR HOT SURFACES

Arco Co., The, Cleveland, O.
Babbitt Chemical Co., New Bedford, Mass.
Barreled Sunlight Paint Co., Providence, R. I. (heat resistant aluminum)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chem Industrial Co., Brooklyn, O.
Chemical Coatings & Engineering Co., Media, Pa.
Chemical Solvent Co., Birmingham, Ala.
Claronex Products, Inc., Brooklyn, N. Y. (liquid aluminum)
Continental Products Co., Euclid, O.
Corrosion Control Co., Inc., New York, N. Y.
Dampney Co., Hyde Park, Boston, Mass.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Felt Products Mfg. Co., Skokie, Ill.
Flexrock Co., Philadelphia, Pa.
Foster Co., Benjamin, Philadelphia, Pa.
Glidden Co., The, Cleveland, O.
Hague & Co., Inc., Alfred, Div. of Lacquer & Chemical Corp., Brooklyn, N. Y.
Hercules Chemical Co., Inc., New York, N. Y.
Horn Companies, A. C., Subsidiary of Sun Chemical Corp., New York, N. Y.
Illinois Bronze Powder Co., Chicago, Ill.
Industrial Finishes Co., Inc., Philadelphia, Pa.
Koppers Company, Inc., Pittsburgh, Pa.
Lastik Paint, Inc., Pittsburgh, Pa.
Markal Co., Chicago, Ill.
Master Mechanics Co., The, Cleveland, O.
Metal & Thermit Corp., Rahway, N. J.
Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
Moran Paint Co., Xenia, O.
Nebel Mfg. Co., Cleveland, O.
Peters Co., The, Div. of Toledo Paint & Chemical Co., Toledo, O.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Randolph-Page, Inc., New York, N. Y. (for radiators)
Rust-Oleum Corp., Evanston, Ill.
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y. (heat-resisting aluminum)
Speco, Inc., Cleveland, O.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich. (aluminum)
Valdura Div., American-Marietta Co., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Whitlam Mfg. Co., J. C., Wadsworth, O.
Wilbur & Williams Co., Norwood, Mass.

PANEL BOARDS

See Boards, Panel and Control

PANEL HEATING AND COOLING

See Coils and Panels, Radiant Heating and Cooling; Panels, Electric Heating

PANELS, ELECTRIC HEATING

Adam Electric Co., Frank, St. Louis, Mo.
Allied Precision Industries, Inc., Geneva, Ill.
Ampere Industries, Newark, N. J.
Arvin Industries, Inc., Columbus, Ind.
Berko Electric Mfg. Co., Queens Village, N. Y.
Can Arm Corp., Champlain, N. Y.
Cavalier Corp., Electric Heating Div., Chattanooga, Tenn.
Ceilheat, Inc., Knoxville, Tenn.
Continental Radiant Glass Heating Corp., New York, N. Y.
Corning Glass Works, Corning, N. Y.
Dixie Raydiant Electric Heat Corp., Atlanta, Ga.
Electrend Products Corp., St. Joseph, Mich.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro Temp Corp., The, Springfield, Mass.
Electrovector, Inc., Brooklyn, N. Y.
Ervite Corp., Erie, Pa. (porcelain enameled)
Everwarm, Inc., Knoxville, Tenn.
Heatmore, Inc., Brooklyn, N. Y.
LaSalle Products, Inc., Buffalo, N. Y.
Matthews Electric Heater Mfg. Co., Albertville, Ala.
Modernheat Cable Corp., Kingsport, Tenn.
Pyrne & Co., Inc., Pomona, Calif.
Radiant Electric Heat Co., Springfield, Ill.
Roberson Inc., Seattle, Wash.
Salton Mfg. Co., Inc., New York, N. Y.
Sunwarm, Inc., Kingsport, Tenn.
Tennessee Plastics, Inc., Johnson City, Tenn.
ThermoRay Corp., Newark, N. J.
Wadsworth Electric Mfg. Co., Inc., Covington, Ky.
Westinghouse Electric Corp., Electric Heater Div., Emeryville, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

PANELS, PERFORATED, FOR AIR DIFFUSION

Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Inc., Chicago.
Mahon Co., R. C., The, Detroit, Mich.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Mundt & Sons, Charles, Jersey City, N. J.
Simplex Ceiling Corp., New York, N. Y.
Wakefield Co., The, Vermilion, O.

PANELS, WINDOW, FOR AIR CONDITIONERS

Russell Co., F. C., The, Columbiana, O.
Southern Plastics Co., Columbia, S. C.

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

Ackermann Mfg. Co., Subsid. of Wheeling Steel Corp., Wheeling, W. Va.
Adams Co., The, Dubuque, Iowa.
Air & Refrigeration Corp., New York, N. Y. (factory insulated panels)
Alter Co., Harry, Chicago, Ill.
Atlas Mfg. Co., St. Paul, Minn. (boiler jackets, furnace cabinets, air conditioning cabinets)
By-Buk Co., Los Angeles, Calif. (pressure sensitive corner pads for preventing surface scratches)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Molded Products Corp., Chicago, Ill. (knobs and handles)
Cincinnati Metalcrafts Inc., Cincinnati, O. (sheet metal fabricating)
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Duro-Dyne Corp., Farmingdale, L. I., N. Y. (hardware and parts used in fabricating dampers and turning vanes)
Eaton Mfg. Co., Foundry Div., Vassar, Mich. (gray iron castings for air conditioning equipment)
Elkhart Products Corp., Elkhart, Ind. (fabricated tubular parts)
Falstrom Co., Passaic, N. J. (Air conditioning cabinets, steel control panels)
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., Detroit, Mich. (bushings, sleeves, ferrules)
General Tire & Rubber Co., Logansport, Ind. (Blower mounting)
Harrison Sheet Steel Co., Chicago, Ill. (covers for radiators)
Mueller Brass Co., Port Huron, Mich. (Specially fabricated copper tubing, machine formed tubes)
National Lock Co., Inc., Rockford, Ill. (hinges, handles, latches, catches, supports, etc.)
Nylok Corp., The, Paramus, N. J. (self-locking fasteners)
Phoenix Products Co., Milwaukee, Wis. (metal spinnings for fan housings, diffusers, etc)
Pittsfield Products, Inc., Ann Arbor, Mich. (perforated wire cloth parts)
Reco Products Div., Recony Corp., New York, N. Y.
Republic Steel Corp., Cleveland, O. (cabinets, housings, canopies)
South Chester Corp., Southco Div., Lester, Pa. (blind rivets, panel fasteners, door retaining springs)
Standard Pressed Steel Co., Jenkintown, Pa. (socket screws, spring pins)
Utica Products, Inc., Utica, N. Y.
Ventfabrics, Inc., Chicago, Ill. (damper hardware for making dampers) (latches and hardware fan access doors)

PARTS, REFRIGERATING COMPRESSORS

(Manufacturers of parts only for repairing compressors. For manufacturers of compressors — See Compressors, Refrigerating)

Alter Co., Harry, Chicago, Ill.
Hunt Spiller Mfg. Corp., Boston, Mass.
Production Stamping Co., Omaha, Nebr.
Sealed Unit Parts Co., Inc., New York, N. Y.
Shank Co., Cyrus, Chicago, Ill.

PENETRANT, DYE, FOR NON-DESTRUCTIVE TESTING OF METAL

Met-L-Chek Co., Los Angeles, Calif.
Turco Products, Inc., Los Angeles, Calif.

PENETRANT SOLVENT FOR LOOSENING THREADED JOINTS

See Solvent, Penetrant

pH INDICATORS
See Indicators, pH

PILLOW BLOCK BEARINGS
See Bearings, Pillow Block

PILOT LIGHTS
See Lights, Pilot and Signal

PILOTS, GAS, FOR OIL BURNERS
Eclipse Fuel Engineering Co., Rockford, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Midwesco, Inc., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Ransome Torch & Burner Co., Emeryville, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Schurs Oil Burner Co., Los Angeles, Calif.
Scully Signal Co., Melrose, Mass.
White-Rodgers Co., St. Louis, Mo.

PINS, FOR FLANGE LINE-UP
Align-O Pipe Guide Co., Barrington, N. J.
Mathey Machine Works, Inc., C. A., Tulsa, Okla.

PIPE, ALUMINUM
Aluminum Co. of America, Pittsburgh, Pa.
Anaconda Aluminum Co., Louisville, Ky.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Revere Copper & Brass, Inc., New York, N. Y.
Reynolds Metals Co., Richmond, Va.
Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, ASBESTOS FIBER AND CEMENT
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.

PIPE BENDERS
See Benders, Pipe

PIPE BIT SETS
See sets, Pipe Bit

PIPE, BRASS AND COPPER
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Lewin-Mathes Co., Div. of Cerro de Pasco Corp., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass, Inc., New York, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich.

PIPE, CAST IRON, PRESSURE, BELL AND SPIGOT
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Central Foundry Co., New York, N. Y.
Clow & Sons, Inc., James B., Chicago, Ill.
Combustion Engineering Inc., New York.
Duriron Co., Inc., Dayton, O. (corrosion resisting)
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y.
United States Pipe & Foundry Co., Birmingham, Ala.

PIPE, CAST IRON, PRESSURE FLANGED
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (corrosion resisting)
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y.
United States Pipe & Foundry Co., Birmingham, Ala.

PIPE, CAST IRON, THREADED
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
United States Pipe & Foundry Co., Birmingham, Ala.

PIPE CLEANING COMPOUNDS
See Compounds, Cleaning
Pipe Coil and Condenser

PIPE CLEANING MACHINES
See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE COILS
See Coils, Pipe

PIPE COUPLINGS
See Couplings, Pipe

PIPE COVERING, ADHESIVES
See Adhesives, for Pipe Covering

PIPE CUTTERS
See Cutters, Pipe

PIPE CUTTING MACHINES
See Machines, Pipe Cutting and Threading; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE EXTRACTORS
See Extractors, Pipe

PIPE, FIBER
Brown Co., Boston, Mass.
Central Foundry Co., New York, N. Y.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (bituminized)

PIPE, FINNED
Brown Fintube Co., Elyria, O.
Crane Co., Chicago, Ill.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
F5 Air Conditioning Corp., Tulsa, Okla.
Frick Co., Waynesboro, Pa. (square and spiral)
Griscom-Russell Co., The, Massillon, O.
Heat Transfer Products, Inc., Perkasie, Pa.
Imeco, Inc., Chicago, Ill.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rome-Turney Radiator Co., Rome, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Vulcan Radiator Co., Hartford, Conn.

PIPE, FINNED
Also See Surface, Finned, Heating; and Surface, Finned, Cooling

PIPE AND FITTINGS, GAS VENT AND FLUE
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Armstrong Fittings Co., Des Moines, Ia.
Condensation Engineering Corp., Chicago, Ill.
Dura-Vent Corp., Redwood City, Calif.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Harvey Aluminum, Torrance, Calif.
Inland Steel Products Co., Milwaukee, Wis.
Johns-Manville, New York, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Metal Fabricators, Inc., Charlotte, N. C.
Meyer & Bro. Co., F., Peoria, Ill.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Robinson Clay Product Co., The, Akron, O.
Van-Packer Co., Div. of the Flintkote Co., Chicago Heights, Ill.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Waverly Heating Supply Co., Beverly, Mass.
Williamson Co., The, Cincinnati, O.

PIPE FITTINGS
See Fittings, Pipe

PIPE, GLASS
Corning Glass Wks., Corning, N. Y.
Fischer & Porter Co., Hatboro, Pa.

PIPE HANGERS
See Hangers and Supports, Pipe

PIPE, HARD RUBBER
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Gates Engineering Co., Wilmington, Del.
General Tire & Rubber Co., Akron, O.
Hewitt-Robins, Inc., Stamford, Conn.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Raybestos-Manhattan, Inc., Passaic, N. J. (Flexible)
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

PIPE INSULATION ADHESIVES
See Adhesives, for Pipe Covering

PIPE, JACKETED
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Durant Insulated Pipe Co., E. Palo Alto, Calif.
Heat & Power Corp., Baltimore, Md.
Hetherington & Berner, Inc., Indianapolis, Ind.
Kaiser Co., E. B., Glenview, Ill.
Midwest Piping Co., Inc., St. Louis, Mo.
Nooter Corp., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Red Jacket, Inc., Carnegie, Pa.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Shaw-Kendall Engineering Co., Toledo, O.
Taylor Engineering Corp., Detroit, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE JOINT COMPOUNDS
See Cement and Compounds, Pipe Joint

PIPE LOCATORS
See Locators, Pipe, Underground

PIPE, LINED
American Cast Iron Pipe Co., Birmingham, Ala. (Cement)
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber)
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Cement)

Division Lead Co., Summit, Ill. (lead)
Gates Engineering Co., Wilmington, Del.
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (pure phenolic baking type; synthetic rubber coating)
Hill, Hubbell & Co., Cleveland, O.
Jones & Laughlin Steel Corp., Pittsburgh, Pa. (plastic lined; cement lined)
Knapp Mills, Inc., Long Island City, N. Y.
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Michigan Pipe Co., Ferndale, Mich. (Wood, saraloy)
National Lead Co., New York, N. Y. (Lead)
Nazar Rubber Co., Toledo, O. (rubber)
Nooter Corp., St. Louis, Mo.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resistoflex Corp., Roseland, N. J. (teflon)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., New York, N. Y. (cement)
Southern Pipe Div. of U. S. Industries, Inc., Azusa, Calif.
United States Rubber Co., New York, N. Y. (Rubber)
United States Stoneware Co., New York.
Youngstown Sheet & Tube Co., Youngstown.

PIPE, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Biggs Boiler Works Co., The, E. Akron, O.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
Harrison Steel Corp., Brooklyn, N. Y.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Revere Copper and Brass, Inc., New York.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, NICKEL PLATED

Bart Mfg. Corp., Belleville, N. J.
Chase Brass & Copper Co., Waterbury, Conn.

PIPE, PLASTIC

Alpha Plastics, Inc., Livingston, N. J. (PVC, rigid)
Amco Plastic Pipe Co., San Leandro, Calif. (rigid & semi-flexible)
Amercoat Corp., South Gate, Calif. (rigid epoxy, 550 psi at 130 F)
American Agile Corp., Bedford, O.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (rigid, flexible)
American Vulcathene Div. Nalge Co., Inc., Rochester, N. Y. (polyethylene semi-rigid, Type A ½ in. to 6 in.)
Anesite Co., Chicago, Ill. (Flexible and semi-rigid; polyethylene, butyrate, kralastic cycolac)
Argo Plastic Products, Cleveland, O. (PVC)
Atlas Mineral Products Co., Mertztown, Pa. (rigid polyvinyl chloride for service up to 150 F)
Brown Co., Boston, Mass (polyethylene)
Byers Co., A. M., Pittsburgh, Pa. (Rigid PVC; 140 F max.)
Camdale Corp., Houston, Tex.
Carlon Products Corp., Aurora, O.
Chesflex Div., St. Regis Paper Co., Yonkers, N. Y. (polyethylene, flexible)
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (Rigid PVC 40 - 160 F pressures function of size, wall thickness and Temp.)
Commercial Plastics Co., Chicago, Ill. (rigid polyvinyl and polyethylene, non-rigid)
Consolidated Pipe Co. of America, Akron, O.
Continental-Diamond Fibre Corp., Newark, Del.
Corite Products, Inc., Chicago, Ill. (rigid fiberglas, reinforced polyester)
Crane Co., Chicago, Ill.
Crane & Associates, Robert S., Columbus, O.
Crescent Plastics, Inc., Evansville, Ind. (flexible, semi-rigid and rigid)
Danielson Mfg. Co., Danielson, Conn.
Dow Chemical Co., Midland, Mich. (saran-lined pipe, iron or steel and saran pipe)
DuVerre, Inc., Buffalo, N. Y. (polyester bonded fiber glass)
Evanite Plastic Co., Div. of Evans Pipe Co., Uhrichsville, O.
Fibercast Co., Sand Spring, Okla. (rigid) 0-1000 psi; −60F to 300F)
Franklin Plastics, Inc., Franklin, Pa. (polyethylene non-rigid. Temp. not to exceed 140 F. Pressures from 40 to 104 lbs.)
General Tire & Rubber Co., Akron, O.
Goodall Rubber Co., Trenton, N. J.(flexible & rigid)
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (polyvinyl chloride rigid)
Goodrich Industrial Products Co., B. F., Akron, O. (Max. 150 F pressures to 400 psi; rigid)
Grinnell Co., Inc., Providence, R. I. (rigid PVC)
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Haveg Industries, Inc., Wilmington, Del. (Resin-asbestos, polyester glass & polyvinyl chloride)
Heil Process Equipment Corp., Cleveland, O. (rigid)
Irvington Div., Minnesota Mining & Mfg. Co., Irvington, N. J. (flexible)
Johnson Plastic Corp., Chagrin Falls, O. Kralastic-rigid: to 180F; pressures: to 150 psi; Polyethylene-non-rigid)
Knight, Maurice A., Akron, O. (rigid, glass cloth reinforced resin 280 F)
Kraloy Plastic Pipe Co., Inc., Los Angeles.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (PVC)
Laminated Sheet Products Corp., Norwood, Mass. (rigid and non-rigid)
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis. (anesite)
Luzerne Rubber Co., Trenton, N. J. (rigid-PVC)
Lynch Asbestos Co., Los Angeles, Calif. (rigid & non-rigid; polyethylene; kralastic; PVC)
Mannesmann-Easton Plastic Products Co., Easton, Pa. (rigid-unplasticized polyvinyl chloride)
Manufacturers Corp., Mansfield, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn. (2" 180 F. 800 psi and 1200 psi operating pressure) (reinforced plastic; rigid)
Mueller Brass Co., Port Huron, Mich. (Rigid temp. range up to 175 F; non-rigid temp. range up to 140 F)
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (flexible polyethylene) (rigid polyvinyl chloride)
Orangeburg Mfg. Co., Orangeburg, N. Y. (polyethylene, flexible, to 150 psi)
Perfex Plastics, Inc., Chicago, Ill.
Plastex Co., Columbus, O. (non-rigid)
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif. (flexible polyethylene; semi-rigid butyrate)
Polymer Corp., The, Reading, Pa. (rigid, nylon)
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Pyramid Industries, Inc., Erie, Pa. (polyethylene, semi-rigid and in coils; for pressures of 75, 100, 125, and 150 psi)
Pyramid Plastics, Inc., Chicago, Ill. (saran; rigid)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers 200 psi; 170F)
Republic Steel Corp., Cleveland, O. (polyethylene, kralastic, and butyrate; flexible & semi rigid)
Ryerson & Son, Inc., Joseph T., Chicago, Ill. (PVC rigid & non-rigid)
Saran Lined Pipe Co., Ferndale, Mich. (saran)
Seelye Craftsmen, Inc., Minneapolis, Minn. (rigid)
Skyline Industries Sales, Inc., Titusville, Pa. (polyethylene and PVC; rigid and flexible) (−40 F to +180 F, 75 psi to 617 psi at 74 F)
Southern Plastics Co., Columbia, S. C. (rigid, non-rigid)
Southwestern Plastic Pipe Co., Mineral Wells, Tex. (polyethylene; PVC; ABS)
Telsco Fittings Div., Dallas, Tex. (Rigid PVC; 75 psi and 125 psi; 140 F max.)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible, semi-rigid high impact & rigid PVC)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Valco Corp., St. Paul, Minn.
Vanton Pump & Equipment Corp., Hillside, N. J. (rigid up to 225F; PVC)
Walworth Co., New York, N. Y. (rigid PVC)
Western Plastics Corp., Tacoma, Wash. (polyethylene & kralastic)
Yardley Plastics Co., Columbus, O. (rigid and non-rigid O F - 125 F)
Youngstown Sheet & Tube Co., Youngstown, O. (rigid)

PIPE PLUGS

See Plugs, Pipe

PIPE, PRE-INSULATED

Beltran Associates, Inc., Brooklyn, N. Y.
Durant Insulated Pipe Co., E. Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Cleveland.
Kaiser Co., E. B., Glenview, Ill.
Ric-wiL, Inc., Barberton, O.

PIPE REAMERS

See Reamers, Pipe

PIPE REPAIR CLAMPS

See Clamps, Pipe Repair

PIPE REPAIR KITS

See Kits, Repair for Pipes, Tanks, Valves, Flanges, and Ducts

PIPE ROTATOR AND HOLDER

See Rotator, Pipe, for Holding Pipe While Cutting, Welding

PIPE, SPIRAL, FOR HIGH VELOCITY AIR SYSTEMS

See Ducts, Spiral Welded

PIPE, SPIRAL, WELDED

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Naylor Pipe Co., Chicago, Ill.
Nikoh Tube Co., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.

PIPE, STEAM TRACED

Aluminum Co. of America, Pittsburgh, Pa.

PIPE, STEEL, BUTT AND LAP WELDED

Alco Products, Inc., Schenectady, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Biggs Boiler Works Co., The, E. Akron, O. (large diameter)
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Fretz-Moon Tube Co., Butler, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kellogg Co., M.W., The, New York, N. Y.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Old Dominion Iron & Steel Corp., Richmond, Va.
Republic Steel Corp., Cleveland, O. (electric-weld)
Revere Copper & Brass, Inc., New York.
Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla. (resistance welded)
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y. (Specially fabricated)
Southern Pipe Div. of U. S. Industries, Inc., Azusa, Calif.
Tubular Div., The National Supply Co., Pittsburgh, Pa.

Wheatland Tube Co., Philadelphia, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, SEAMLESS

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Electric Steel Foundry Co., Portland, Ore.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Southern Pipe Div. of U. S. Industries, Inc., Azusa, Calif.
Tubular Div., The National Supply Co., Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, STAINLESS

Alco Products, Inc., Schenectady, N. Y.
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.
Greenville Tubes, Inc., Greenville, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Ladish Co., Cudahy, Wis.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Republic Steel Corp., Cleveland, O.
Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Standard Tube Co., Detroit, Mich.
Swepco Tube Corp., Clifton, N. J.
Trent Tube Co., East Troy, Wis.
Union Steel Corp., Union, N. J.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STONEWARE

General Ceramics Corp., Keasbey, N. J.
Knight, Maurice A., Akron, O. (acid-proof)
Lapp Insulator Co., LeRoy, N. Y.
United States Stoneware Co., New York.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (also porcelain)

PIPE SUPPORTS

See Hangers and Supports, Pipe

PIPE SURFACE, THERMOMETERS

See Thermometers, Indicating, Pipe Surface

PIPE THREADERS

See Stocks and Dies

PIPE, TIN

Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., San Francisco, Calif.
Division Lead Co., Summit, Ill.
Enderle, Inc., Ltd., Frank X., Los Angeles.
Gardiner Metal Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.

PIPE TONGS

See Tongs, Pipe

PIPE, TUBING, FITTINGS AND VALVES, CARBON AND GRAPHITE

General Ceramics Corp., Keasbey, N. J.
National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.

PIPE AND TUBING, LEAD AND LEAD ALLOY

American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., San Francisco, Calif.
Division Lead Co., Summit, Ill.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
Knapp Mills, Inc., Long Island City, N. Y.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.
Rochester Lead Works, Inc., Rochester, N. Y.

PIPE, VITRIFIED CLAY

American Vitrified Products Co., Cleveland, O.
Bowerston Shale Co., The, Bowerston, O.
General Ceramics Corp., Keasbey, N. J.
Heat Transmission Conduit Co., Cleveland, O.
Logan Clay Products, Logan, O.
National Clay Pipe Mfg. Inc., Washington, D. C.
Robinson Clay Product Co., The, Akron, O.
Straitsville Brick Co., New Straitsville, O.
Superior Clay Corp., The, Uhrichsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Universal Sewer Pipe Corp., Cleveland, O.

PIPE, WOOD

Fluor Products Co., Santa Rosa, Calif.

PIPE WRENCHES

See Wrenches, Pipe

PIPE, WROUGHT IRON

Byers Co., A. M., Pittsburgh, Pa.

PIPING, FABRICATED

See Bends, Expansion, Steam Pipe; Headers, Pipe, Welded; Coils, Pipe

PIPING IDENTIFICATON MARKERS

See Identification Markers for Piping Services

PISTON RINGS

See Rings, Piston

PITOT TUBES

See Tubes, Pitot

PITTSBURGH LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

PLASTIC PIPE METAL INSERTS

See Inserts, Metals, for Plastic Pipe

PLASTIC PIPE AND PIPE FITTINGS

See Pipe, Plastic; Fittings, Pipe, Plastic

PLASTIC PIPE AND SHEET WELDERS

See Welders, for Plastic Pipe or Plastic Sheet

PLASTIC SHEETS FOR DUCTS AND HOODS

See Sheets, Plastic for Ducts and Hoods

PLASTIC TUBING

See Tubing, Plastic

PLASTICS, POWDERS AND RESINS (BASIC MATERIALS)

Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Chemical Coatings & Engineering Co., Media, Pa.
Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Co., Midland, Mich.
du Pont de Nemours & Co., E. I. Polychemicals Dept., Wilmington, Del. (nylon, polyethylene, fluorocarbon, acrylic & acetal resins)
Durex Plastics Div., Hooker Chemical Corp., North Tonawanda, N. Y.
Eastman Chemical Products, Inc., Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Enjay Co., New York, N. Y.
General Electric Co., Chemical Materials Dept., Pittsfield, Mass. (phenolic) (polycarbonate resin)
General Tire & Rubber Co., Akron, O.
Goodrich Chemical Co., B. F., Cleveland, O.
Hercules Powder Co., Wilmington, Del.
Interchemical Corp., Finishes Div., Newark, N. J. (polyester resins)
Koppers Co., Inc., Pittsburgh, Pa.
Metal & Thermit Corp., Rahway, N. J.
Monsanto Chemical Co., Springfield, Mass.
Naugatuck Chemical Div., U. S. Rubber Co., Naugatuck, Conn.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn. (acetate, butyrate, propionate, polyethylene, polypropylene)
Polymer Corp., The, Reading, Pa.
Union Carbide Plastics Co., Div. of Union Carbide Corp., New York, N. Y.

PLATES, FLOOR AND CEILING

Ackermann Mfg. Co., Subsid. of Wheeling Steel Corp., Wheeling, W. Va.
American Sanitary Mfg. Co., Abingdon, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Eastern Stainless Steel Corp., Baltimore, Md. (stainless steel)
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
G & H Mfg. Co., Philadelphia, Pa.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Providence, R. I.
Inland Steel Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Little Brass Goods Co., M. S., Hartford, Conn.
Modern Hanger Corp., The, Cleveland, O.
New York Air Valve Corp., Brooklyn, N. Y.
Pipe Plugs, Inc., Wellington, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
U. S. Expansion Bolt Co., York, Pa.
U. S. Plug & Fitting Co., Wellington, O.
Zurn Industries, Inc., Erie, Pa.

PLUGS, CAPS AND CLOSURES FOR PROTECTING PIPE AND TUBE FITTINGS

Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Clover Industries, Inc., Tonawanda, N. Y.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Pipe Plugs, Inc., Wellington, O.
Plastiline, Inc., White Plains, N. Y. (plastic)
Protective Closures Co., Inc., Caplugs Div., Buffalo, N. Y.
Scharer & Co., Ray A., Detroit, Mich.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
U. S. Plug & Fitting Co., Wellington, O.
Wedge Protectors, Inc., Cleveland, O.

PLUG COCKS

See Valves, Plug

PLUG VALVES

See Valves, Plug

PLUGS, FUSIBLE, BOILER

Allen Mfg. Co., W. D., Bellwood, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chiksan Co., Brea, Calif.
Division Lead Co., Summit, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.

Lamson & Sessions Co., The, Cleveland, O.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
Powell Co., Wm., The, Cincinnati, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

PLUGS, PIPE, MAGNETIC, FOR REMOVING FERROUS PARTICLES

Pipe Plugs, Inc., Wellington, O.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, PIPE, PRESSURE

Camco Fittings, Inc., North Haven, Conn.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Fibercast Co., Sand Spring, Okla.
Grabler Mfg. Co., Cleveland, O.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Pipe Plugs, Inc., Wellington, O.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O.
Ward Foundries, Inc., J. P., Blossburg, Pa.

PLUGS, REPAIR, FOR PIPE

Adams Pipe Repair Products, So. El Monte, Calif.
Baker & Co., R. H., Los Angeles, Calif.
Kuhns Bros. Co., Dayton, O.
Ladish Co., Cudahy, Wis.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Pipe Plugs, Inc., Wellington, O.
Scharer & Co., Ray A., Detroit, Mich.
U. S. Plug & Fitting Co., Wellington, O.
Williamson, Inc., T. D., Tulsa, Okla.

PLUGS, REPAIR, FOR TANKS

Adams Pipe Repair Products, So. El Monte, Calif.
Baker & Co., R. H., Los Angeles, Calif.
Chicago Specialty Mfg. Co., Chicago, Ill.
Kenney Co., L. C., Chicago, Ill.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Pipe Plugs, Inc., Wellington, O.
Standard Pressed Steel Co., Jenkintown, Pa.
Tankit Co., The, Newark, N. J.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, TUBING TEST

Chicago Specialty Mfg. Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Mechanical Products Corp., Chicago, Ill.
Scharer & Co., Ray A., Detroit, Mich.

PORTABLE ELECTRIC SNOW MELTER

See Snow Melter, Portable, Electric

PORTS, OBSERVATION, BOILER

Bigelow Liptak Corp., Detroit, Mich.
Detroit Stoker Co., Monroe, Mich.
Green Fire Brick Co., Mexico, Mo.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Photomation, Inc., Bergenfield, N. J.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Springfield Boiler Co., Springfield, Ill.

POSITIONERS, DRILL, FOR DRILLING HOLES AT REGULAR INTERVALS IN PIPE

Buck Mfg. Co., San Jose, Calif.
Eisler Engineering Co., Inc., Newark, N. J.

POSITIONERS, WELDING

Aronson Machine Co., Arcade, N. Y.
Buck Mfg. Co., San Jose, Calif.
Eisler Engineering Co., Inc., Newark, N. J.
Johnson Machine Works, Eau Claire, Wis.
Peck Co., Cecil C., Cleveland, O.
Sight Feed Generator Co., West Alexandria, O. (automatic; submerged arc)
Webb Corp., The, Webb City, Mo.
Weldit, Inc., Detroit, Mich.

Worthington Corp., East Orange, N. J.

POWER FACTOR CORRECTION

See Capacitors

POWER SHEARS

See Shears, Power

PREHEATERS, FUEL OIL

Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American-Standard Industrial Div., Detroit.
Andale Co., Philadelphia, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Bros, Inc., Minneapolis, Minn.
Buxton Mfg. Co., Dover, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Co., Flushing, L. I., N. Y.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drying Systems Co., Chicago, Ill.
Electro-Therm, Inc., Silver Spring, Md.
Engineer Co., New York, N. Y.
Falcon Equipment Co., New Brighton, Pa.
General Fittings Co., East Greenwich, R. I.
Griscom-Russell Co., Massillon, O.
Hauck Mfg. Co., Brooklyn, N. Y.
Heatron, Inc., York, Pa.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo. (Electric)
Johnson Corp., The, Three Rivers, Mich.
Killebrew Engineering Corp., St. Louis, Mo.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Manning & Lewis Engineering Co., Newark, N. J.
Mar-Coil Heater Co., Union City, N. J.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
Old Dominion Iron & Steel Corp., Richmond, Va.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Staples & Pfeiffer, San Francisco, Calif.
Superior Combustion Industries, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tranter Mfg., Inc., Lansing, Mich.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Waage Electric, Inc., Kenilworth, N. J.
Water Tube Boiler & Tank Co., Chicago, Ill.
Whitlock Mfg. Co., W. Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (Electric)
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.
Yula Corp., Bronx, N. Y.

PREHEATERS AND STRESS RELIEVERS, ELECTRIC, FOR PIPE WELDS

Electric Arc, Inc., Newark, N. J.
Falcon Equipment Co., New Brighton, Pa.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Hobart Bros. Co., Troy, O.
Trent Inc., Philadelphia, Pa.
Universal Welder Corp., Cleveland, O.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

PRE-INSULATED PIPE

See Pipe, Pre-Insulated

PRESSURE BLOWERS

See Blowers, High Pressure

PRESSURE CONTROLLERS

See Regulators, Pressure

PRESSURE GAGES

See Gages, Indicating, Pressure

PRESSURE INDICATOR-CONTROLLERS

See Indicator-Controllers, Pressure

PRESSURE RECORDER-CONTROLLERS

See Recorder-Controllers, Pressure

PRESSURE RECORDERS

See Recorders, Pressure and Vacuum

PRESSURE REDUCING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATORS

See Regulators, Pressure

PRESSURE SWITCHES

See Switches, Pressure and Vacuum

PROCESS HEATING SYSTEMS

See Systems, Process Heating, High Temperature

PROCESS STEAM SUPERHEATERS

See Superheaters, Process Steam

PROCESS AND STORAGE TANKS

See Tanks, Process and Storage

PROPANE VAPORIZERS

See Vaporizers

PROPELLER FANS

See Fans, Propeller

PROPELLER PUMPS

See Pumps, Propeller

PROPORTIONING PUMPS

See Pumps, Proportioning

PROTECTIVE COATINGS

See Coatings, Protective, for Metals

PROTECTORS, GAGE GLASS

Blossom Mfg. Co., Inc., Brooklyn, N. Y.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Industrial Engineering Corp., Louisville, Ky.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.

PROTECTORS, PIPE COVERING

Aljon Mfg. Co., Inc., Maspeth, N. Y.
American Sisalkraft Corp., Attleboro, Mass.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Bigelow Liptak Corp., Detroit, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Blossom Mfg. Co., Inc., Brooklyn, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Childers Mfg. Co., Houston, Tex.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
General Aluminum Supply Co., Kansas City, Mo.
Grant Wilson, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Modern Hanger Corp., The, Cleveland, O.
Poe Co., C. W., The, Cleveland, O. (Alum. jacketing)

Rector Mineral Trading Corp., New York, N. Y.
Smith Products Co., Northville, Mich.
Zippertubing Co., The, Los Angeles, Calif.

PSYCHROMETERS, MOTOR ASPIRATED

American Moistening Co., Cleveland, N. C.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N.Y.
Scientific Instrument Co., Detroit, Mich.
Universal Instruments Co., Brentwood, Md.
Weksler Instruments Corp., Freeport, L. I., N. Y.

PSYCHROMETERS, SLING AND HAND ASPIRATED

Abbeon Supply Co., Jamaica, N. Y.
Airserco Mfg. Co., Pittsburgh, Pa.
American Moistening Co., Cleveland, N. C.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Evanston, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Kent-Moore Organization, Inc., Warren, Mich.
Moeller Instrument Co., Richmond Hill, N.Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I., N. Y.

PSYCHROSTATS

See Humidistats

PULLEYS AND SHEAVES, FOR BELT DRIVES

American Pulley Co., Philadelphia, Pa. (adjustable diameter)
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill. (V belt)
Chicago Die Casting Mfg. Co., Chicago, Ill. (V-type and flat type)
Climax Metal Products Co., Cleveland, O. (V-belt and variable pitch)
Congress Drives Div., Tann Corp., Detroit, Mich. (V belt—fractional horsepower)
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn. (V-Belt)
Duro Metal Products Co., Chicago, Ill. (steel & diecast)
Ft. Worth Steel & Machinery Co., Ft. Worth, Texas
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga. (Cast iron)
Hewitt-Robins, Inc., Stamford, Conn. (Tapered cone, conveyor, flanged, grooved for round or V-Belt, iron, loose, motor, power transmission)
Hi-Lo Mfg. Co., Minneapolis, Minn. (variable pitch)
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill. (flat)
Lau Blower Co., Dayton, O.
Lewellen Mfg. Co., Columbus, Ind. (variable speed pulleys)
Lovejoy Flexible Coupling Co., Chicago, Ill. (variable speed pulleys, v-belt sheaves)
Maurey Mfg. Corp., Chicago, Ill. (Flat belt, v-belt steel and cast iron)
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.
Morse Chain Co., Ithaca, N. Y. (sprockets for timing belt drives)
Pyott Foundry and Machine Co., Aurora, Ill.
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind. (variable speed)
Speed Selector Inc., Chagrin Falls, O. (variable pitch)
Sprout-Waldron & Co., Inc., Muncy, Pa. (cast iron standard pulleys)
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., East Orange, N. J. (v-type)
Zatko Metal Products Co., Euclid, O. (stamped-one piece)

PULVERIZED COAL BURNERS

See Burners, Pulverized Coal

PUMP BASES

See Bases, Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type

PUMP-MOTOR UNITS, CLOSE-COUPLED

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Carver Pump Co., Muscatine, Ia.
Chicago Pump Co., Subsid. Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark, N. J.
Fostoria Corp., Huntingdon Valley, Pa. (canned motor)
Gelber & Sons, Inc., S., Chicago, Ill.
Gorman-Rupp Co., Mansfield, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Haskel Engineering & Supply Co., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
LaBour Co., Inc., The, Elkhart, Ind.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Lecourtenay Co., Newark, N. J.
Marlow Pumps, Div. of Bell & Gossett Co., Midland Park, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Red Jacket Mfg. Co., Davenport, Ia.
Roper Hydraulics, Inc., Rockford, Ill.
Ruthman Machinery Co., Cincinnati, O.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sundstrand Hydraulics, Rockford, Ill.
Swaby Mfg. Co., Chicago, Ill.
Taco Heaters, Inc., Cranston, R. I.
Tuthill Pump Co., Chicago, Ill.
Uniflow Mfg. Co., Erie, Pa.
Vanton Pump & Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wire Products Co., Baltimore, Md.
Worthington Corp., East Orange, N. J.

PUMP UNITS, FUEL OIL

See Units, Fuel Oil, Heating, Pumping and Straining

PUMP VALVES

See Valves, Pump

PUMPS, BOILER FEED

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Meter Co., Pump Div., Philadelphia, Pa.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Harford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gelber & Sons, Inc., S., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Ingersoll-Rand Co., New York, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., A Div. of Youngstown Sheet & Tube Co., Pasadena, Calif.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Preferred Utilities Mfg. Corp., New York.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schaub Engineering Co., Fred H., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.

Union Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Universal Mfg. Co., Berkeley, Calif.
Warren Pumps, Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CENTRIFUGAL

Advance Pump Co., Berkeley, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Wks., Aurora, Ill.
Ampco Metal, Inc., Milwaukee, Wis.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Barrett Haentjens & Co., Hazleton, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Chain Belt Co., Milwaukee, Wis.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus.
Corcoran Co., R. S., Joliet, Ill.
Corley Co., Inc., The, Bounton, N. J.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Dean Brothers Pumps, Inc., Indianapolis.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Duriron Co., Inc., Dayton, O. (corrosion resisting)
Duro Co., The, Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark, N. J.
Essick Mfg. Co., Los Angeles, Calif.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Fostoria Corp., Huntingdon Valley, Pa. (magnetically driven canned motor)
Frederick Iron & Steel Inc., Frederick, Md.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Gardner-Denver Co., Quincy, Ill.
Gelber & Sons, Inc., S., Chicago, Ill.
Gen-A-Matic Corp., Van Nuys, Calif.
General Ceramics Corp., Keasbey, N. J. (chemical plastic and alumina, porcelain and graphite)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Goodfellow Co., Inc., F. D., Memphis, Tenn.
Gorman-Rupp Co., Mansfield, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hydropump, Inc., Pasadena, Calif.
Industrial Filter & Pump Co., Cicero, Ill.
Ingersoll-Rand Co., New York, N. Y.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
La Bour Co., Inc., The, Elkhart, Ind.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pump Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Layne & Bowler, Inc., Memphis, Tenn.
Layton Co., Inc., Cudahy, Wis.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined and all lead)
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O. (self-priming; complete with own power source)
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Marlow Pumps, Division of Bell & Gossett Co., Midland Park, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Midwest Pump Div. of Sherwood Mfg. Co., Independence, Mo.
Morris Machine Works, Baldwinsville, N. Y.
Myers & Bro. Co., F. E., The, Ashland, O.
National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
National Lead Co., New York, N. Y.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Price Pump Co., E. L., Sonoma, Calif.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Ruthman Machinery Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich. (Saran Lined)
Skidmore Corp., St. Joseph, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Sutton Mfg. Co., Norfolk, Va.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Union Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Warren Pumps, Inc., Warren, Mass.
Wayne Pump Co., Div. of Symington Wayne Corp., Ft. Wayne, Ind.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wilson-Snyder Wks., Oil Well Supply Div., U. S. Steel Corp., Braddock, Pa.
Wire Products Co., Baltimore, Md.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONDENSATE, FOR REMOVING CONDENSATION FROM AIR CONDITIONING UNITS

For removal of water condensed from air on cooling and dehumidifying coils. For Condensate Return Pumps, see Pumps, Condensate Return. For Air Conditioning Pumps, see Pumps of various types, such as pumps, Centrifugal and others

Ashcraft Co., J. P., Dallas, Tex.
Beach-Russ Co., New York, N. Y.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Eastern Industries, Inc., Hamden, Conn.
Eddington Metal Specialty Co., Eddington, Pa.
Gelber & Sons, Inc., S., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
March Mfg. Co., Inc., Skokie, Ill.
Midwest Pump Div. of Sherwood Mfg. Co., Independence, Mo.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Palmer Electric Co., Inc., Detroit, Mich.
Sterling, Inc., Milwaukee, Wis.
Warren Pumps, Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.

PUMPS, CONDENSATE RETURN

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Comfort Mfg. Co., Evanston, Ill.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Cochrane Corp., Philadelphia, Pa.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Faber Engineering Co., Inc., Norristown, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Foster Wheeler Corp., New York, N. Y.
Fostoria Corp., Huntingdon Valley, Pa. (canned motors)
Frederick Iron & Steel Inc., Frederick, Md.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Heating Assurance, Inc., Spokane, Wash.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Kisco Boiler & Engineering Co., St. Louis.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roth Co., Roy E., Rock Island, Ill.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sellers Engineering Co., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Union Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Warren Pumps, Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONTROLLED VOLUME

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Meter Co., Pump Div., Philadelphia, Pa.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.

Dearborn Chemical Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Hills-McCanna Co., Chicago, Ill.
Lapp Insulator Co., LeRoy, N. Y.
Madden Corp., The, Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Wallace & Tiernan, Inc., Belleville, N. J.

PUMPS, DEEP WELL

Advance Pump Co., Berkeley, Calif.
American Well Wks., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Clayton Mark & Co., Evanston, Ill.
Davidson Co., M. T., New York, N. Y.
Decatur Pump Co., Decatur, Ill. (shallow well)
Deming Co., Salem, O.
Duro Co., Dayton, O.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fiese & Firstenberger Mfg., Inc., Fresno, Calif.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa. (submersible)
Layne & Bowler, Inc., Memphis, Tenn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Red Jacket Mfg. Co., Davenport, Ia.
Sta-Rite Products, Inc., Delavan, Wis.
Sumo Pumps, Inc., Stamford, Conn.
Uniflow Mfg. Co., Erie, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wintroath Pump, Div. of Worthington Corp., Alhambra, Calif.
Worthington Corp., East Orange, N. J.

PUMPS, EVAPORATIVE COOLER

Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Carver Pump Co., Muscatine, Ia.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Essick Mfg. Co., Los Angeles, Calif.
Fostoria Corp., Huntingdon Valley, Pa. (canned motors)
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
International Metal Products, Phoenix, Ariz.
Jabsco Pump Co., Burbank, Calif.
Krueger Air Conditioning Co., Tucson, Ariz.
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Midwest Pump Div. of Sherwood Mfg. Co., Independence, Mo.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Palmer Mfg. Corp., Phoenix, Ariz.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Ruthman Machinery Co., Cincinnati, O.
Taco Heaters, Inc., Cranston, R. I.
Thermador Electrical Mfg., Los Angeles, Calif.
Warren Pumps, Inc., Warren, Mass.
Weinman Pump Mfg. Co., The, Columbus, O.
Wright Mfg. Co., Phoenix, Ariz.

PUMPS, FIRE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Barnes Manufacturing Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goodyear Pumps, Inc., New York, N. Y. (portable)
Gorman-Rupp Co., Mansfield, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Layne & Bowler, Inc., Memphis, Tenn.
Lecourtenay Co., Newark, N. J.
Marlow Pumps, Division of Bell & Gossett Co., Midland Park, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Royalton Co., Inc., Gasport, N. Y.
Solar Aircraft Co., San Diego, Calif. (gas turbine)
Universal Mfg. Co., Berkeley, Calif.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Worthington Corp., East Orange, N. J.

PUMPS, GEAR

American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
DeLaval Steam Turbine Co., Trenton, N. J.
Eastern Industries, Inc., Hamden, Conn.
Eco Engineering Co., Newark, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Granberg Corp., Oakland, Calif.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich. (hydraulic)
Mechanical Products Corp., Chicago, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Roper Hydraulics, Inc., Rockford, Ill.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Tuthill Pump Co., Chicago, Ill.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Worthington Corp., East Orange, N. J.

PUMPS, HIGH PRESSURE, HYDRAULIC

Aldrich Pump Co., Allentown, Pa.
American Engineering Co., Philadelphia, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Meter Co., Pump Div., Philadelphia, Pa.
Autoclave Engineers Sales Corp., Erie, Pa.
Blackhawk Mfg. Co., Milwaukee, Wis.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Gorman-Rupp Co., Mansfield, O.
Gray Co., Inc., Minneapolis, Minn.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Henderer's Sons, A. L., Wilmington, Del.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Kobe Inc., Huntington Park, Calif.
LeCourtenay Co., Newark, N. J.
Ledeen Mfg. Co., El Monte, Calif.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro., Co., F. E. The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Nye Tool Co., Chicago, Ill.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Robbins & Myers, Inc., Springfield, O.
Roper Hydraulics, Inc., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Tuthill Pump Co., Chicago, Ill.
Union Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Wilson Co., K. R., Arcade, N. Y.
Worthington Corp., East Orange, N. J.

PUMPS, HYDROSTATIC TEST, HAND-OPERATED

Autoclave Engineers Sales Corp., Erie, Pa.
Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Henderer's Sons, A. L., Wilmington, Del.
Pacific Pumping Co., Oakland, Calif.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.

PUMPS, JET

Advance Pump Co., Berkeley, Calif.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Clayton Mark & Co., Evanston, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Co., The, Dayton, O.
Everite Pump & Mfg. Co., Lancaster, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Universal Mfg. Co., Berkeley, Calif.
Whitewater Pump Co., Inc., Whitewater, Wis.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

PUMPS, LIQUID REFRIGERANT CIRCULATING

American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Corley Co., Inc., The, Bounton, N. J.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Corp., Huntingdon Valley, Pa. (canned motors)
Goulds Pumps, Inc., Seneca Falls, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Kohlenberger Engineering Corp., Fullerton, Calif.
Lawrence Pump & Engine Co., Lawrence, Mass.
LeCourtenay Co., Newark, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Pacific Pumping Co., Oakland, Calif.
Roper Hydraulics, Inc., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
Union Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Viking Pump Co., Cedar Falls, Ia.
Vilter Mfg. Co., Milwaukee, Wis.
Warren Pumps, Inc., Warren, Mass.
Watkins Co., J. E., Maywood, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

PUMPS, PROPELLER

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

American Well Works, Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Corp., Huntingdon Valley, Pa. (canned motors)
Frederick Iron & Steel Inc., Frederick, Md.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Ruthman Machinery Co., Cincinnati, O.
Universal Mfg. Co., Berkeley, Calif.
Warren Pumps, Inc., Warren, Mass.
Worthington Corp., East Orange, N. J.

PUMPS, PROPORTIONING

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Pump Div., Philadelphia, Pa.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.
Dearborn Chemical Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Hills-McCanna Co., Chicago, Ill.
Lapp Insulator Co., LeRoy, N. Y.
Madden Corp., The, Chicago, Ill.
Marco Development Co., Inc., Wilmington, Del.
Mechanical Products Corp., Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O
Pacific Pumping Co., Oakland, Calif.
Robbins & Myers, Inc., Springfield, O.
Texsteam Corp., Houston, Tex.
Universal Mfg. Co., Berkeley, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Wallace & Tiernan Inc., Belleville, N. J.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

PUMPS, RECIPROCATING

Aldrich Pump Co., Allentown, Pa.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber and Rubber lined)
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes Mfg. Co., Mansfield, O.
Canton Stoker Corp., Canton, O.
Champion Pneumatic Machinery Co., Princeton, Ill.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.
Clayton Mark & Co., Evanston, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Deming Co., Salem, O.
Duro Co., Dayton, O.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Company, Inc., Minneapolis, Minn.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Ledeen Mfg. Co., El Monte, Calif.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O. (diaphragm type; self-priming; complete with own power source)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Novo Pump and Engine Co., Lansing, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Royalton Co., Inc., Gasport, N. Y.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Union Pump Co., Battle Creek, Mich.
Warren Pumps, Inc., Warren, Mass.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., East Orange, N. J.

PUMPS, REFRIGERANT TRANSFER, FOR FILLING SERVICE CYLINDERS

Belt-Ice Corp., Seattle, Wash.
Blackmer Pump Co., Grand Rapids, Mich.
Gelber & Sons, Inc., S., Chicago, Ill.
Heatron, Inc., York, Pa.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kinney Mfg. Div., New York Air Brake Co., Boston, Mass.
Kohlenberger Engineering Corp., Fullerton, Calif.
Robinair Mfg. Corp., Edgerton, O.
Roth Co., Roy E., Milan, Ill.

PUMPS, ROTARY

American Engineering Co., Philadelphia, Pa.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber and rubber lined)
Beach-Russ Co., New York, N. Y.
Binks Mfg. Co., Chicago, Ill.
Blackmer Pump Co., Grand Rapids, Mich.
Chicago Pneumatic Tool Co., New York.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa
Eastern Industries, Inc., Hamden, Conn.
Eco Engineering Co., Newark, N. J.
Eisler Engineering Co., Inc., Newark, N. J
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Jabsco Pump Co., Burbank, Calif.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Marco Development Co., Inc., Wilmington, Del.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Nash Engineering Co., South Norwalk, Conn.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Nyberg, Stig C., Rye, N. Y.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Procon Pump & Engineering Co., Oak Park, Mich.
Robbins & Myers, Inc., Springfield, O.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Roper Hydraulics, Inc., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
St. Louis Tool Co., St. Louis, Mo.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sethco Mfg. Corp., Merrick, N. Y. (with filter for acids)
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sundstrand Hydraulics, Rockford, Ill. (for oil burners high and low pressure)
Sutorbilt Corp., Subsidiary of Fuller Co., Compton, Calif.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Vanton Pump and Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Waukesha Foundry Co., Waukesha, Wis.
Wayne Pump Co., Div. of Symington Wayne Corp., Ft. Wayne, Ind.
Webster Electric Co., Racine, Wis. (unit pump for oil burners)
Worthington Corp., East Orange, N. J.
Yale & Towne Mfg. Co., White Plains, N. Y.

PUMPS, SEWAGE AND SLUDGE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Works, Aurora, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gelber & Sons, Inc., S., Chicago, Ill.
Gorman-Rupp Co., Mansfield, O.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Lawrence Pumps, Inc., Lawrence, Mass.
Marlow Pumps, Division of Bell & Gossett Co., Midland Park, N. J.
Novo Pump & Engine Co., Lansing, Mich.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Robbins & Myers, Inc., Springfield, O.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Swaby Mfg. Co., Chicago, Ill.
Thor Power Tool Co., Aurora, Ill.
Universal Mfg. Co., Berkeley, Calif.
Warren Pumps, Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SEWAGE AND SLUDGE, SUBMERSIBLE

American Well Wks., Aurora, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Chicago Pneumatic Tool Co., New York.
Chicago Pump Co., Subsid. of Food Machinery & Chemical Corp., Chicago, Ill.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (Compressed air operated)
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Pacific Pumping Co., Oakland, Calif.
Robbins & Myers, Inc., Springfield, O.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Thor Power Tool Co., Aurora, Ill.
Universal Mfg. Co., Berkeley, Calif.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., Columbus, O.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, STEAM

American-Marsh Pumps, Inc., Battle Creek, Mich.
Canton Stoker Corp., Canton, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Gardner-Denver Co., Quincy, Ill.
National Steam Pump Co., Upper Sandusky, O.
Novo Pump & Engine Co., Lansing, Mich.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Union Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Warren Pumps, Inc., Warren, Mass.
Worthington Corp., East Orange, N. J.

PUMPS, SUMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Barrett Haentjens & Co., Hazleton, Pa.
Berkeley Pump Co., Berkeley, Calif.
Bruner Corp., Milwaukee, Wis.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.

Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Chicago Pneumatic Tool Co., New York.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Clayton Mark & Co., Evanston, Ill.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
DeVilbiss Metal Fabricators Co., Detroit, Mich.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Frederick Iron & Steel Inc., Frederick, Md.
Friermood Machine Works, Converse, Ind.
Gardner-Denver Co., Quincy, Ill.
Gelber & Sons, Inc., S., Chicago, Ill.
Gorman-Rupp Co., Mansfield, O.
Goulds Pump, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kol-Master Corp., Oregon, Ill
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Layne & Bowler, Inc., Memphis, Tenn.
Marlow Pumps, Division of Bell & Gossett Co., Midland Park, N. J.
Metalmaster Corp., Newark, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Reif-Rexoil, Inc., Buffalo, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schramm, Inc., West Chester, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sethco Mfg. Corp., Merrick, N. Y. (all plastic)
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Thor Power Tool Co., Aurora, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uniflow Mfg. Co., Erie, Pa.
Union Pump Co., Battle Creek, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Warren Pumps, Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wintroath Pumps, Div. of Worthington Corp., Alhambra, Calif.
Wire Products Co., Baltimore, Md.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SUMP, SUBMERSIBLE

Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Barrett Haentjens & Co., Hazleton, Pa.
Berkeley Pump Co., Berkeley, Calif.
Bruner Corp., Milwaukee, Wis.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Corcoran Co., R. S., Joliet, Ill.
Dayton Electric Mfg. Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Co., The, Dayton, O.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Layne & Bowler, Inc., Memphis, Tenn.
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Pacific Pumping Co., Oakland, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Remington Arms Co., Inc., Bridgeport, Conn.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Swaby Mfg. Co., Chicago, Ill.
Thor Power Tool Co., Aurora, Ill.
Wayne Pump Co., Div. of Symington Wayne Corp., Ft. Wayne, Ind.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., Columbus, O.
Whitewater Pump Co., Inc., Whitewater, Wis.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.
Wire Products Co., Baltimore, Md.
Worthington Corp., East Orange, N. J.

PUMPS, TURBINE TYPE

Advance Pump Co., Berkeley, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Wells Works, Aurora, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Chicago Pump Co., Subsid. of Food Machinery & Chemical Corp., Chicago, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Decatur Pump Co., Decatur, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Federal Pump Corp., Brooklyn, N. Y.
Fiese & Firstenberger Mfg., Inc., Fresno, Calif.
General Tire & Rubber Co., Akron, O.
Ingersoll-Rand Co., New York, N. Y.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Roth Co., Roy E., Rock Island, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Universal Mfg. Co., Berkeley, Calif.
Wintroath Pumps, Div. of Worthington Corp., Alhambra, Calif.
Worthington Corp., East Orange, N. J.

PUMPS, VACUUM

Airserco Mfg. Co., Pittsburgh, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Atlas Copco Eastern, Inc., Paramus, N. J.
Barrett Haentjens & Co., Hazleton, Pa.
Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Canton Stoker Corp., Canton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brother Pumps, Inc., Indianapolis, Ind.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eisler Engineering Co., Inc., Newark, N. J.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Foster Wheeler Corp., New York, N. Y.
Fuller Co., Catasauqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gelman Instrument Co., Chelsea, Mich.
General Ceramics Corp., Keasbey, N. J. (Chemical)
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Joy Mfg. Co., Pittsburgh, Pa.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Sutorbilt Corp., Subsidiary of Fuller Co., Compton, Calif.
Union Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Will Corp., Rochester, N. Y.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, VACUUM HEATING

American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Baker, Inc., C. I., Lorain, O.
Barnes & Jones, Inc., Newtonville, Mass.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T.. New York, N. Y.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Faber Engineering Co., Inc., Norristown, Pa.
Gardner-Denver Co., Quincy, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Sarco Co., Inc., New York, N. Y.
Skidmore Corp., St. Joseph, Mich.
Union Pump Co., Battle Creek, Mich.
Warren Pumps, Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., East Orange, N. J.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Meter Co., Pump Div., Philadelphia, Pa.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Pumps, Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Clark-Cooper Co., Inc., C C Pump Div., Palmyra, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (compressed air operated)
Foster Pump Wks., Inc., Brooklyn, N. Y.

Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goodyear Pumps, Inc., New York, N. Y.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Gray Co., Inc., Minneapolis, Minn.
Hetherington & Berner, Inc., Indianapolis, Ind. (jacketed)
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Madden Corp., The, Chicago, Ill.
Marco Development Co., Inc., Wilmington, Del.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Novo Pump & Engine Co., Lansing, Mich.
Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Robbins & Myers, Inc., Springfield, O.
Rockwell Co., W. S., Fairfield, Conn.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., Connersville, Ind.
Roper Hydraulics, Inc., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Union Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Universal Mfg. Co., Berkeley, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Pumps, Inc., Warren, Mass.
Wayne Pump Co., Div. of Symington Wayne Corp., Ft. Wayne, Ind.
Weinman Pump Mfg. Co., Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., East Orange, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUNCHES, SHEET METAL

Billings & Spencer Co., Hartford, Conn.
Blackhawk Mfg. Co., Milwaukee, Wis.
Cleveland Punch & Shear Wks. Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Duro-Dyne Corp., Farmingdale, L. I., N. Y.
Duro Metal Products Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Leslie Welding Co., Inc., Chicago, Ill.
M-M-A, Inc., Lancaster, Pa.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Nye Tool Co., Chicago, Ill.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn
Reiner & Campbell Co., Inc., Newark, N. J. (clips)
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Swaine Mfg. Co., Fred J., St. Louis, Mo.
Thor Power Tool Co., Aurora, Ill.
Thor Tool & Die Co., San Leandro, Calif.
Webb Corp., The, Webb City, Mo.
Whitney Mfg. Co., W. A. Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Weidemann Machine Co., King of Prussia, Pa.
Zeh & Hahnemann Co., Newark, N. J.

PURGERS, REFRIGERANT GAS

Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

PUSHERS, PIPE, HYDRAULIC

Blackhawk Mfg. Co., Milwaukee, Wis.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Giant Mfg. Co., Council Bluffs, Ia.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hydraulic Mfg. Co., Bridgeport, Conn.
Mercury Hydraulics, Inc., Denver, Colo.
Wilson Co., K. R., Arcade, N. Y.

PYROMETERS

See Radiometers, Thermal, for Radiant Heat Measurements

RACKS, STORAGE, PIPE

Acme Steel Co., Chicago, Ill. (slotted angle)
Adams Co., The, Dubuque, Ia.
Beaver Advance Corp., Ellwood City, Pa.
Bernard-Franklin Co., Inc., Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Cady Metal Fabricating Co., North Tonawanda, N. Y.
California Steel Products Div., Richmond, Calif.
Elcen Metal Products Co., Franklin Park, Ill.
Haertel Co., Walter, Minneapolis, Minn.
Industrial Tubular Equipment Co., North Hollywood, Calif.
Modern Hanger Corp., The, Cleveland, O.
Mult-A-Frame Corp., Detroit, Mich.
Palmer-Shile Co., Detroit, Mich.
Republic Steel Corp., Cleveland, O.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.
XXth Century Heating & Ventilating Co., The, Akron, O.

RADIANT HEAT MEASUREMENT

See Radiometers

RADIANT HEAT THERMOSTATS

See Thermostats, Radiant Heat

RADIANT HEATING AND COOLING CEILINGS

See Coils and Panels, Radiant Heating, Prefabricated

RADIANT HEATING AND COOLING

See Coils and Panels, Radiant Heating, Prefabricated

RADIANT HEATING ELECTRICAL CONDUCTORS

See Panels, Electric Heating

RADIATION

Also See Surface, Finned, Heating

RADIATION, BASEBOARD, ELECTRIC HEATING ELEMENT

Acme Electric Heating Co., Boston, Mass.
Ampere Industries, Newark, N. J.
Arvin Industries, Inc., Columbus, Ind.
Berko Electric Mfg. Corp., Queens Village, N. Y.
Brown Products Corp., Union, N. J.
Cavalier Corp., Electric Heating Div., Chattanooga, Tenn.
Ceilheat, Inc., Knoxville, Tenn.
Circle Air Industries, Inc., Brooklyn, N. Y.
Electriliving Corp., Indianapolis, Ind.
Electro-Ray Mfg. Co., Inc., Vancouver, Wash.
General Alliance Corp., San Diego, Calif.
General Electric Co., Wiring Device Dept., Providence, R. I.
Heatmore, Inc., Brooklyn, N. Y.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
LaSalle Products, Inc., Buffalo, N. Y.
Modernheat Cable Corp., Kingsport, Tenn.
Radiation Electric Heat Co., Springfield, Ill.
Ramco Mfg. and Engineering Co., Portland, Ore.
Roberson, Inc., Seattle, Wash.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spartan Electric Radiator Corp., Maspeth, N. Y.
Sundial Electric Co., Richmond Hill, N. Y.
Sunwarm, Inc., Kingsport, Tenn.
Swan Mfg. Co., Vancouver, Wash.
Tennessee Plastics, Inc., Johnson City, Tenn.
Thermador Electrical Mfg., Los Angeles, Calif.
Vulcan Electric Co., Danvers, Mass.
Vulcan Radiator Co., Hartford, Conn.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., E. L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

RADIATION, BASEBOARD, FERROUS

American-Standard Plumbing & Heating Div., New York, N. Y.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dean-Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Farrell Associates, Charles, Valencia, Pa.
Fedders Corp., Heating Div., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
National-U. S. Radiator Corp., Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Sterling Radiator Co., Inc., Westfield, Mass.
Trane Co., The, La Crosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Utica Radiator Corp., Utica, N. Y.
Vulcan Radiator Co., Hartford, Conn.
Weil-McLain Co., Michigan City, Ind.
Woodside Engineering Co., Franklin Park, Ill.

RADIATION, BASEBOARD, FITTINGS

For special fittings, see Fittings, Pipe, Special, for Baseboard Radiation

RADIATION, BASEBOARD, NON-FERROUS

American-Standard Plumbing & Heating Div., New York, N. Y.
Argo Industries, Inc., Hartford, Conn.
Axeman-Anderson Co., Williamsport, Pa.
Baseline Mfg. Co., Minneapolis, Minn.
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Beacon-Morris Corp., Boston, Mass.
Brown Products Corp., Union, N. J.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Continental Mfg. Co., Baltimore, Md.
Convector Corp., Washington, D. C.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ejay Baseboard Mfg. Co., Winsted, Conn.
Embassy Steel Products, Inc., Brooklyn.
Farrell Associates, Charles, Valencia, Pa.
Fedders Corp., Heating Div., Trenton, N. J.
Federal Boiler Co., Inc., Midland Park, N. J.
General Automatic Products Corp., Baltimore, Md.
General Heating Products Co., Philadelphia, Pa.
Governale Bros., Inc., Brooklyn, N. Y.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hydrotherm, Inc., Northvale, N. J.
I. W. Air Conditioning Corp., New York, N. Y.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Patco Mfg. Co., Inc., Philadelphia, Pa.
Peerless of America, Inc., Chicago, Ill.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.

Radiant-Ray Radiation, Inc., Newington, Conn.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spartan Electric Radiator Corp., Maspeth, N. Y.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Wescott Snyder Mfg. Corp., Madison, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, CONVECTION TYPE, ELECTRIC HEATING ELEMENT

Acme Electric Heating Co., Boston, Mass.
Argo Industries, Inc., Hartford, Conn.
Berko Electric Mfg. Co., Queens Village, N. Y.
Ceilheat, Inc., Knoxville, Tenn.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Electriliving Corp., Indianapolis, Ind.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Ray Mfg. Co., Inc., Vancouver, Wash.
Embassy Steel Products, Inc., Brooklyn, N. Y.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Meier Electric, Indianapolis, Ind.
Modernheat Cable Corp., Kingsport, Tenn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Spartan Electric Radiator Corp., Maspeth, N. Y.
Sundial Electric Co., Richmond Hill, N. Y.
Sunwarm, Inc., Kingsport, Tenn.
Thermador Electrical Mfg., Los Angeles, Calif.
Vulcan Electric Co., Danvers, Mass.
Vulcan Radiator Co., Hartford, Conn.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Zell-Aire Corp., Reading, Pa.

RADIATION, CONVECTION TYPE, FERROUS

American-Standard Plumbing & Heating Div., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Brown Products Corp., Union, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders Corp., Heating Div., Trenton, N. J.
Governale Bros., Inc., Brooklyn, N. Y.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
I. W. Air Conditioning Corp., New York, N. Y.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Tranter Mfg., Inc., Lansing, Mich.

RADIATION, CONVECTION TYPE, NON-FERROUS

Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Plumbing & Heating Div., New York, N. Y.
Argo Industries, Inc., Hartford, Conn.
Beacon-Morris Corp., Boston, Mass.
Brown Products Corp., Union, N. J.
Convector Corp., Washington, D. C.
Dunham-Bush, Inc., West Hartford, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Eastern Boiler Co., Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn.
Fedders Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Heating Products Co., Philadelphia, Pa.
Governale Bros., Inc., Brooklyn, N. Y.
Heat-Exchangers, Inc., Chicago, Ill.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Hoff Mfg. Co., Bethany, New Haven, Conn.
I. W. Air Conditioning Corp., New York, N. Y.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt Inc., John J., Philadelphia, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Patco Mfg. Co., Philadelphia, Pa.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Spartan Electric Radiator Corp., Maspeth, N. Y.
Tenney Engineering Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Wescott Snyder Mfg. Corp., Madison, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, DIRECT

American-Standard Plumbing & Heating Div., New York, N. Y.
Burnham Corp., Irvington, N. Y.
Clow & Sons, Inc., James B., Chicago, Ill. (Gas fired)
Crane Co., Chicago, Ill.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Rittling Corp., The, Buffalo, N. Y.
Utica Radiator Corp., Utica, N. Y.
Weil-McLain Co., Michigan City, Ind.
Wilson Engineering Corp., Chicago, Ill.

RADIATION, FIN TUBE TYPE

Alstrom Corp., New York, N. Y.
Argo Industries, Inc., Hartford, Conn.
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Brown Products Corp., Union, N. J.
Convector Corp., Washington, D. C.
Crane Co., Chicago, Ill.
Drayer-Hanson, Div. of National U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Eastern Boiler Co., Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Electro-Ray Mfg. Co., Inc., Vancouver, Wash.
Embassy Steel Products, Inc., Brooklyn.
Fedders Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Automatic Products Corp., Baltimore, Md.
General Heating Products Co., Philadelphia, Pa.
Heat Transfer Products, Inc., Perkasie, Pa.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hydrotherm, Inc., Northvale, N. J.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Moore Dry Kiln Co., Jacksonville, Fla.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Peerless of America, Inc., Chicago, Ill.
Radiant-Ray Radiation, Inc., Newington, Conn.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Super Radiator Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Vapor Heating Corp., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
York-Shipley, Inc., York, Pa.

RADIATOR AND CONVECTOR HUMIDIFIERS

See Humidifiers for Radiators and Convectors

RADIATOR HANGERS

See Hangers or Brackets, Radiation

RADIATOR ORIFICES

See Orifices, Radiator

RADIATOR ORIFICE VALVES

See Valves, Radiator, Orifice

RADIATOR VALVES

See Valves, Radiator

RADIATOR VENT VALVE HUMIDIFIERS

See Humidifiers, Radiator Vent Valve

RADIATORS, ELECTRIC

Acme Electric Heating Co., Boston, Mass.
Burnham Corp., Irvington, N. Y. (portable steam)
I. W. Air Conditioning Corp., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spartan Electric Radiator Corp., Maspeth, N. Y.
ThermoRay Corp., Newark, N. J.
Vulcan Radiator Co., Hartford, Conn.

RADIATORS, GAS FIRED

Bettcher Mfg. Corp., The, Cleveland, O.
Fedders Corp., Heating Div., Trenton, N. J.

RADIATORS, HUMIDIFYING

Murray Mfg. Co., D. J., Wausau, Wis.

RADIOACTIVE ISOTOPES FOR DETECTING LEAKS IN PIPING AND HEATING SYSTEMS

See Isotopes, Radioactive

RADIOGRAPHIC INSPECTION

See Equipment, Radiographic Inspection

RADIOMETERS, THERMAL, FOR RADIANT HEAT MEASUREMENTS

Atkins Technical, Inc., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.

RATCHET WRENCHES

See Wrenches, Ratchet

REAMERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., P ville, N. J.
Armstrong Bros. Tool Co., Chicago,
Beaver Pipe Tools, Inc., Warren,
Chicago Specialty Mfg. Co., C igo, Ill.
Greenfield Tap & Die Div. of U d Greenfield Corp., Greenfield, Mass.
Holub Industries, Inc., Sycam , Ill.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.

Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Thor Power Tool Co., Aurora, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.

RECEIVERS, REFRIGERANT, LIQUID

Acme Industries, Inc., Jackson, Mich.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lehigh Mfg. Co., Div. of Lehigh, Inc., Easton, Pa.
Refrigeration Research, Inc., Brighton, Mich.
Remco, Inc., Zelienople, Pa.
Tube Manifold Corp., North Tonawanda, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Worthington Corp., East Orange, N. J.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.

RECIPROCATING PUMPS

See Pumps, Reciprocating

RECORDER-CONTROLLERS, COMBINED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Partlow Corp., The, New Hartford, N. Y.
Scientific Instrument Co., Detroit, Mich.
Serdex, Inc., Boston, Mass.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Weksler Instruments Corp., Freeport, L. I., N. Y.

RECORDER-CONTROLLERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Serdex, Inc., Boston, Mass.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Universal Dynamics Corp., Arlington, Va.
Weksler Instruments Corp., Freeport, L. I., N. Y.

RECORDER-CONTROLLERS, PRESSURE

American Meter Co., Inc., Philadelphia, Pa.
Automatic Control Co., St. Paul, Minn.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Power Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Swartwout Fabricators, Inc., Kokomo, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I.

RECORDER-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Partlow Corp., The, New Hartford, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Serdex, Inc., Boston, Mass.
Swartwout Fabricators, Inc., Kokomo, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I.
West Instrument Corp., Chicago, Ill.

RECORDER-TOTALIZERS, TIME, FOR HEATING SYSTEMS

Air Conditioning Equipment Corp., New York, N. Y.
Au-Temp Co Corp., New York, N. Y.
Cramer Controls Corp., Centerbrook, Conn.
Haydon Co., A. W., The, Waterbury, Conn.
Heat-Timer Corp., New York, N. Y.
Standard Instrument Div., Heat Timer Corp., New York, N. Y.

RECORDERS, CARBON DIOXIDE

Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, COMBINED TEMPERATURE AND HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Evanston, Ill.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati, O.
Partlow Corp., The, New Hartford, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
Universal Instruments Co., Brentwood, Md.
Weksler Instruments Corp., Freeport, L. I., N. Y.

RECORDERS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Cargocaire Engineering Corp., New York, N. Y.
Foxboro Co., Foxboro, Mass.
Mine Safety Appliances Co., Pittsburgh, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Surface Combustion Corp., Toledo, O.
Weighing & Control Components, Inc., Hatboro, Pa.

RECORDERS, DRAFT

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., Boody, Ill.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Moore Products Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Evanston, Ill.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Nor-

wood), O.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Universal Dynamics Corp., Arlington, Va.
Universal Instruments Co., Brentwood, Md.
Weksler Instruments Corp., Freeport, L. I.

RECORDERS, LIQUID LEVEL

American Meter Co., Inc., Philadelphia, Pa.
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Liquidometer Corp., Long Island City, N. Y.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Simplex Valve & Meter Co., Lancaster, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Texas Instruments, Inc., Houston, Tex.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

RECORDERS, OXYGEN

Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Monterey Park, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Victory Engineering Corp., Union, N. J.

RECORDERS, PRESSURE AND VACUUM

American Meter Co., Inc., Philadelphia, Pa.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Crosby Valve & Gage Co., Wrentham, Mass.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Autolite Co., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Evanston, Ill.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Swartwout Fabricators, Inc., Kokomo, Ind.

Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals Inc., Sellersville, Pa.
Weksler Instruments Corp., Freeport, L. I., N. Y.

RECORDERS, SMOKE DENSITY

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Electronics Corp. of America, Cambridge, Mass.
Gelman Instrument Co., Chelsea, Mich.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., The, Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Photomation, Inc., Bergenfield, N. J.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.

RECORDERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Autolite Co., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Green Instruments, Inc., Henry J., Westbury, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O. (Mercury-actuated)
Partlow Corp., The, New Hartford, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals Inc., Sellersville, Pa.
Universal Instruments Co., Brentwood, Md.
Victory Engineering Corp., Union, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.
West Instrument Corp., Chicago, Ill.
Westronics, Inc., Fort Worth, Tex.

RECORDING THERMOMETERS

See Recorders, Temperature

RECOVERY EQUIPMENT, AIR

See Adsorbers, Odor, for Duct Systems

RECOVERY UNITS, HEAT, AIR TO AIR

See Units, Heat Recovery, Air to Air

REDUCERS AND INCREASERS, SPEED

Abart Gear & Machine Co., Chicago, Ill.
Adams Co., The, Dubuque, Iowa
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Bodine Electric Co., Chicago, Ill.
Boston Gear Wks., Quincy, Mass.
Brown-Brockmeyer Co., Inc., Dayton, O.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
De Laval Steam Turbine Co., Trenton, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Falk Corp., Milwaukee, Wis.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Janette Electric Mfg. Co., Morton Grove, Ill.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lima Electric Motor Co., Inc., The, Lima, O.
Link Belt Co., Chicago, Ill. (herringbone, worm gear)
Master Electric Co., Div. of Reliance Electric & Engineering Co., Dayton, O.
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Corp., Philadelphia, Pa.
Poole Foundry & Machine Co., Baltimore, Md.
Reliance Electric & Engineering Co., Cleveland, O.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sterling Electric Motors, Inc., Los Angeles, Calif.
Terry Steam Turbine Co., The, Hartford, Conn.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
Worthington Corp., East Orange, N. J.

REFRACTORIES AND REFRACTORY CEMENT

Allen Co., Robert G., Mechanicsville, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Basic Inc., Cleveland, O.
Bigelow Liptak Corp., Detroit, Mich.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Dixon Crucible Co., Joseph, Jersey City, N. J.
France Refractories, Co., J. H., Snow Shoe, Pa.
Green Fire Brick Co., Mexico, Mo.
Johns-Manville, New York, N. Y.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Rex Clay Products Co., Detroit, Mich.
Rex Roto Corp., Walled Lake, Mich.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.
Zonolite Co., Chicago, Ill.

REFRIGERANT DEHYDRATORS

See Dehydrators, Refrigerant

REFRIGERANT FILTERS

See Filters, Refrigerant

REFRIGERANT GAGE SETS
See Gage Sets, Refrigeration

REFRIGERANT GAS PURGERS
See Purgers, Refrigerant Gas

REFRIGERANT SLUG ELIMINATORS
See Eliminators, Slug, Refrigerant

REFRIGERANT TRANSFER SYSTEMS
See Pumps, Refrigerant Transfer

REFRIGERANTS
American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif. (Refrigerants 11, 12, 22, 113, 114, sulphur dioxide methyl chloride)
Ansul Chemical Co., Refrigeration Div., Marinette, Wis. (methyl, chloride, sulphur dioxide)
Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill. (Anhydrous ammonia)
Carrier Corp., Syracuse, N. Y. (carrene)
Dow Chemical Co., The, Midland, Mich.
du Pont de Nemours & Co., Inc., E. I., Electrochemicals Dept., Wilmington, Del. (Methyl chloride and methylene chloride)
du Pont de Nemours & Co., Inc., E. I., Freon Products Div., Wilmington, Del. (fluorinated hydrocarbon refrigerants)
General Chemical Div., Allied Chemical Corp., New York, N. Y. (R-12 Dichlorodifluoromethane, R-114A Dichlorotetrafluoroethane, R-22 Monochlorodifluoromethane, R-11 Trichloromonofluoromethane, R-113 Trichlorotrifluoroethane)
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill. (carbon dioxide)
Monsanto Chemical Co., St. Louis, Mo. (anhydrous ammonia)
Pennsalt Chemicals Corp., Philadelphia, Pa. (ammonia, fluorinated hydrocarbons) (packaged refrigerants)
Pennsylvania Engrg. Co., Philadelphia, Pa.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Sun Oil Co., Philadelphia, Pa. (Anhydrous ammonia)
Texaco, Inc., New York, N. Y. (ammonia)
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y. (fluorocarbons; glycols)
Virginia Smelting Co., West Norfolk, Va., (Methyl chloride, liquid sulphur dioxide.)

REFRIGERATING COMPRESSORS
See Compressors, Refrigerating

REFRIGERATION ACCUMULATORS
See Accumulators, Refrigeration

REFRIGERATION CHASSIS
See Unitary Air Conditioners, Summer

REFRIGERATION CONTROLS
See Valves, Refrigeration

REFRIGERATION FITTINGS
See Fittings, Refrigeration

REFRIGERATION MANIFOLDS
See Manifolds, Refrigeration

REFRIGERATION VALVES
See Valves, Refrigeration

REGISTERS
See also Diffusers; Grilles; Panels, Perforated, for Air Diffusion
A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles.
Air-Factors, Inc., Covina, Calif.
AirGuide Plastics Corp., Miami, Fla. (molded nylon)
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Char-Gale Mfg. Co., Minneapolis, Minn.
Connor Engineering Corp., Danbury, Conn.
Controlair Mfg. Co., Los Angeles, Calif.
Corbman Bros., Inc., Philadelphia, Pa.
Diamond Mfg. Co., Wyoming, Pa.
Dole Valve Co., The, Morton Grove, Ill. (Automatic register)
Empire Ventilation Equipment Co., Long Island City, N. Y.
General Air Products Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Inc., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
International Mfg. Co., Oklahoma City, Okla.
Krueger Air Conditioning Co., Tucson, Ariz.
Lenly Mfg. Co., Inc., Los Angeles, Calif.
Lima Register Co., The, Lima, O.
Maurlee Co., Inc., Woodbury Heights, N. J.
Metal Industries, Inc., Clearwater, Fla.
Midco Register Corp., St. Paul, Minn.
Register & Grille Mfg. Co., Inc., Brooklyn.
Rhoads Engineering Corp., Culver City, Calif.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Inc., Waterloo, Ia.
Young Regulator Co., Cleveland, O.

REGISTER UNITS, FOR SECONDARY AIR SUPPLY FOR OIL BURNERS
Engineer Co., New York, N. Y.
Faber Engineering Co., Inc., Norristown, Pa.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Warren Register and Grille, Inc., Miami, Fla.

REGULATORS, AIR VELOCITY
Ace Instrument Co., Inc., Brooklyn, N. Y.
Barber-Colman Co., Rockford, Ill.
Cleveland Controls, Inc., Cleveland, O.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Thermal Agency, Houston, Tex.
Trane Co., The, La Crosse, Wis.

REGULATORS, DAMPER SETS
Ace Instrument Co., Inc., Brooklyn, N. Y.
Acme Mfg. Co., Philadelphia, Pa.
Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Adams Co., The, Dubuque, Ia.
Air Conditioning Products Co., Detroit, Mich.
Ashcraft Co., J. P., Dallas, Tex.
Atlas Valve Co., Newark, N. J.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Cleveland Controls, Inc., Cleveland, O.
Crown Controls Co., Inc., New Bremen, O.
Defender Instrument & Regulator Co., Boody, Ill.
Duro-Dyne Corp., Farmingdale, L. I., N. Y.
Elgen Mfg. Co., Long Island City, N. Y.
Ellison Draft Gage Co., Chicago, Ill.
Foster Wheeler Corp., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill. (electric)
Gerett Corp., M. A., Milwaukee, Wis.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Sarcotherm Controls, Inc., New York, N. Y.
Thermal Agency, Houston, Tex.
United States Register Co., Battle Creek, Mich.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

REGULATORS, DRAFT, COMBUSTION
A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Ace Instrument Co., Inc., Brooklyn, N. Y.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Controls, Inc., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
Ellis Draft Gage Co., Chicago, Ill.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Foxboro Co., Foxboro, Mass.
Fuelguard Co., Dallas, Tex.
GPE Controls, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hays Corp., The, Michigan City, Ind.
Kol-Master Corp., Oregon, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Photomation, Inc., Bergenfield, N. J.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill. (Industrial)
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Markesan, Wis.
Simplex Mfg. Co., Fond du Lac, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Steinen Mfg. Co., Wm., Newark, N. J.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Webster Engineering Co., Tulsa, Okla.
Windmaster Div., Lima Register Co., Lima, O.
Worner Electronic Devices, Rankin, Ill.

REGULATORS, FLUID FLOW, FOR CONSTANT VOLUME
Independent of Pressure
A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Bailey Co., Chas. M., San Francisco, Calif.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Cla-Val Co., Newport Beach, Calif.
Dole Valve Co., The, Morton Grove, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
GPE Controls, Inc., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Hays Mfg. Co., Erie, Pa.
Henszey Co., Watertown, Wis.
Kates Co., W. A., The, Deerfield, Ill.
Klipfel Valves, Inc., Hamilton, O.
McDonnell & Miller, Inc., Chicago, Ill.
Taco Heaters, Inc., Cranston, R. I.

REGULATORS, LEVEL, LIQUID
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Associated Valve Co., North Wales, Pa.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.

Bristol Co., The, Waterbury, Conn.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Newport Beach, Calif.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
GPE Controls, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Henszey Co., Watertown, Wis.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Petrometer Corp., Long Island City, N. Y.
Phillips & Co., H. A., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.

REGULATORS, PRESSURE, AIR

Ace Instrument Co., Inc., Brooklyn, N. Y.
Allen-Bradley Co., Milwaukee, Wis.
American Flow Control Corp., Houston, Tex.
American Meter Co., Inc., Philadelphia, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., Baltimore, Md.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Burrows Mfg. Co., F. A., York, Pa.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
GPE Controls, Inc., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif.
Gray Co., Inc., Minneapolis, Minn.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hanna Engineering Wks., Chicago, Ill.
Hannifin Corp., DesPlaines, Ill.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Keckley Co., O. C., Skokie. Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Nielan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Newark Controls Co., Bloomfield, N. J.
Nielsen, Inc., E. V., Stamford, Conn.
Norgren Co., C. A., Englewood, Colo.
OPW-Jordan, Cincinnati, O.
Penn Controls, Inc., Goshen, Ind.
Perfecting Service Co., Charlotte, N. C.
Powers Regulating Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sall Bros. Co., Rockford, Ill.
Schade Valve Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Markesan, Wis.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Burlington, Mass.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Conneaut, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Young Regulator Co., Cleveland, O.

REGULATORS, PRESSURE, GAS

Ace Instrument Co., Inc., Brooklyn, N. Y.
Allen-Bradley Co., Milwaukee, Wis.
American Flow Control Corp., Houston, Tex.
American Meter Co., Inc., Philadelphia, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cam-Stat, Inc., Div. of the Paul Henry Co., Los Angeles, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Davis Regulator Co., Chicago, Ill.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Deutsch Controls Corp., Los Angeles, Calif.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
GPE Controls, Inc., Chicago, Ill.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
K-G Equipment Co., Allentown, Pa.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Major Controls, Corona, Calif.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
North American Mfg. Co., Cleveland, O.
OPW-Jordan, Cincinnati, O.
Penn Controls, Inc., Goshen, Ind.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill. (Industrial)
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelpha, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Markesan, Wis.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Conneaut, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermac Co., Corona, Calif.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weldit, Inc., Detroit, Mich.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEMS

Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Boylston Steam Specialty Co., Chicago, Ill.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.

Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Mfg. Co., Cleveland, O.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Fisher Governor Co., Marshalltown, Ia.
Hays Corp., The, Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Englewood, Colo.
OPW-Jordan, Cincinnati, O.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
White-Rodgers Co., St. Louis, Mo.

REGULATORS, PRESSURE, LIQUID

Allen-Bradley Co., Milwaukee, Wis.
American Flow Control Corp., Houston, Tex.
Atlas Valve Co., Newark, N. J.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., Baltimore, Md.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eddington Metal Specialty Co., Eddington, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
GPE Controls, Inc., Chicago, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Gray Co., Inc., Minneapolis, Minn.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Norgren Co., C. A., Englewood, Colo.
OPW-Jordan, Cincinnati, O.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill. (industrial)
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Conneaut, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
White-Rodgers Co., St. Louis, Mo.
Wilkins Regulator Co., Los Angeles, Calif. (hot and cold water)
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Feed water)

REGULATOR, STATIC PRESSURE, AIR DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Shallcross Controls, Inc., Markesan, Wis.

REGULATORS, TEMPERATURE

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Aerco Corp., Northvale, N. J.
Allen-Bradley Co., Milwaukee, Wis.
American Instrument Co., Inc., Silver Spring, Md.
American-Standard Detroit Controls Div., Detroit, Mich.
Assembly Products, Inc., Chesterland, O.
Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Century Instrument Co., Detroit, Mich.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crown Controls Co., Inc., New Bremen, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fenwal Inc., Ashland, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Appliance Control Dept., Morrison, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Lawler Automatic Controls, Inc., Mount Vernon, N. Y.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McCorkle Co., D. H., Berkeley, Calif.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
OPW-Jordan Corp., Cincinnati, O.
Partlow Corp., The, New Hartford, N. Y.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Ranco Incorporated, Columbus, O.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E. The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Swartwout Fabricators, Inc., Kokomo, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Laurence, Mass.
West Instrument Corp., Chicago, Ill.
Wheelco Instruments Co., Chicago, Ill.
White-Rodgers Co., St. Louis, Mo. (Hydraulic-Action)
Yellow Springs Instrument Co., Inc., Yellow Springs, O.
Young Regulator Co., Cleveland, O.

REGULATORS, VACUUM

Associated Valve Co., North Wales, Pa.
Beach-Russ Co., New York, N. Y.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Oxygen Equipment & Service Co., Chicago, Ill. (oxygen)
Penn Controls, Inc., Goshen, Ind.
Squires Co., C. E., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.

RELAYS, ELECTRICAL

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J. (time delay)
Advance Relays, Product of Electronics Div., Elgin National Watch Co., Burbank, Calif.
Aemco Inc., Mankato, Minn.
Airserco Mfg. Co., Pittsburgh, Pa.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
American Instrument Co., Inc., Sliver Spring, Md.
American-Standard Detroit Controls Div., Detroit, Mich.

Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Assembly Products, Inc., Chesterland, O.
Automatic Switch Co., Florham Park, N. J.
Barber-Colman Co., Rockford, Ill.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Baso, Inc., Milwaukee, Wis.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Better Engineered Controls, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Clark Controller Co., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Daytronic Corp., Dayton, O.
Deltron, Inc., Philadelphia, Pa.
Ebert Electronics Corp., Queens Village, N. Y.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Electric Autolite Co., Toledo, O.
Electro-Switch & Controls, Inc., Culver City, Calif.
Essex Wire Corp., Ft. Wayne, Ind.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Appliance Control Dept., Morrison, Ill.
Guardian Electric Mfg. Co., Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hart Mfg. Co., The, Hartford, Conn.
Haydon Co., A. W., Waterbury, Conn.
Heinemann Electric Co., Trenton, N. J.
International Business Machines Corp., New York, N. Y
Leach Relay Co., Los Angeles, Calif.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mears Electric Controls, Inc., Portland, Ore.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
National Controls, Inc., Newton, Mass.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia.
Photomation, Inc., Bergenfield, N. J.
Potter & Brumfield, Princeton, Ind.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Signet Controls, Portland, Ore.
Simpson Electric Co., Chicago, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass. (motor starting relays)
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheelock Signals, Inc., Long Branch, N. J.
White-Rodgers Co., St. Louis, Mo.
Zell-Aire Corp., Reading, Pa.
Zenith Electric Co., Chicago, Ill.

RELAYS, PNEUMATIC

Allen-Bradley Co., Milwaukee, Wis.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.

RELIEF VALVES

See Valves, Relief

REPAIR CLAMPS

See Clamps, Pipe Repair

REPAIR PLUGS FOR TANKS

See Plugs, Repair, for Tanks

RESEATERS, VALVE

Chicago Specialty Mfg. Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Economy Valve Seat Co., Bellwood, Ill.
Hammett Electric Co., Kansas City, Kans.
Leavitt Machine Co., Orange, Mass.
Skinner Co., M. B., South Bend, Ind.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Thor Power Tool Co., Aurora, Ill.

RETURN BENDS

See Bends, Pipe, Return

REVERSE REFRIGERATION CYCLE UNITS

See Unitary Air Conditioners, Year Around, Heat Pump (Reverse Refrigeration Cycle)

RINGS, BACKING, FOR PIPE WELDING

Alco Products, Inc., Schenectady, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Arcos Corp., Philadelphia, Pa.
General Ceramics Corp., Keasbey, N. J.
Grinnell Co., Inc., Providence, R. I.
Midwest Piping Co., Inc., St. Louis, Mo.
O.T.M. Corp., Houston, Tex.
Robvon Backing Ring Co., Elizabeth, N. J.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Wedge Protectors, Inc., Cleveland, O.

RINGS, PISTON, FOR COMPRESSORS

Koppers Company, Inc., Metal Products Div., Baltimore, Md.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Perfect Circle Corp., Hagerstown, Ind.
Sealed Power Corp., Muskegon, Mich.

ROD, GAS WELDING

Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Ampco Metal, Inc., Milwaukee, Wis.
Atlantic Steel Co., Atlanta, Ga.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Eutectic Welding Alloys Corp., Flushing, N. Y.
International Nickel Co., The, New York, N. Y.
K-G Equipment Co., Allentown, Pa.
Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J.
Mir-O-Col Alloy Co., Los Angeles, Calif. (for hard facing)
National Cylinder Gas Div. of Chemetron Corp., Chicago. Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Revere Copper and Brass, Inc., New York, N. Y.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS

See Bearings, Roller

ROOF COOLERS

See Systems, Roof Spraying

ROOF SPRAYING SYSTEMS

See Systems, Roof Spraying

ROOF VENTILATORS

See Ventilators, Roof

ROOM HUMIDIFIERS

See Humidifiers, Unit Room Type; and Unitary Air Conditioners, Winter

ROOM THERMOSTATS

See Thermostats, Room or Wall

ROTARY PUMPS

See Pumps, Rotary

ROTATOR, PIPE, FOR HOLDING PIPE WHILE CUTTING, WELDING

Aronson Machine Co., Arcade, N. Y.
Peck Co., Cecil C., Cleveland. O.

RUBBER BELTING

See Belting, Flat Rubber

RUBBER PACKING

See Packing, Rubber and Synthetic

RUBBER PIPE

See Pipe, Hard Rubber

SADDLE VALVES

See Valves, Saddle

SADDLE TEES

See Fittings, Pipe, Saddle Tee

SADDLES FOR PIPE

See Fittings, Pipe, Saddle Tee

SAFETY VALVES

See Valves, Safety, Steam

SALAMANDERS

See Heaters, Air, Direct Fired, Portable

SAWS, ELECTRIC, PORTABLE

Albertson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., The, Towson, Md.
Chicago Pneumatic Tool Co., New York, N. Y.
Clipper Mfg. Co., Kansas City, Mo. (for masonry)
Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.
Eveready Briksaw Co., Kansas City, Mo. (for masonry)
Ingersoll-Rand Co., New York, N. Y.
Key-Hak Div., Producers & Distributors, Inc., Allentown, Pa.
Krieg, Inc., Victor J., New York, N. Y. (for cutting pipe)
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Portable Electric Tools, Inc., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
R C S Tool Corp., Bloomington, Ill. (reciprocating)
Remington Arms Co., Inc., Bridgeport, Conn.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., LaGrange Park, Ill.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Starbuck & Sons, Inc., R. M., Hartford, Conn.
Syntron Co., Homer City, Pa.
Thor Power Tool Co., Aurora, Ill.
United States Electrical Tool Co., Cincinnati, O.
Wachs Co., E. H., The, Chicago, Ill.
Wallace Supplies Mfg. Co., Chicago, Ill. (for abrasive materials)
Wen Products, Inc., Chicago, Ill.

SCAFFOLDS, PORTABLE

American Ladder & Scaffold Co., Inc., Miami, Fla.
Beaver-Advance Corp., Ellwood City, Pa.
Bil-Jax, Inc., Archbold, O.

Building Service Co., Minneapolis, Minn.
Up-Right Scaffolds, Berkeley, Calif.
Waco Steel Scaffolding, Inc., Waco, Tex.

SCALE CONTROL

See Devices, Electrolytic; Treatment, Steam System; Treatment, Water

SCALE REMOVAL, CHEMICAL SERVICE FOR

Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
Magnus Chemical Co., Garwood, N. J.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Solvent Service, Inc., Painesville, O.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS

A-J Mfg. Co., Kansas City, Mo.
Air Devices, Inc., New York, N. Y.
Cain Mfg. Inc., Birmingham, Ala.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
General Air Products Corp., Cedar Grove, N. J.
Krueger Air Conditioning Corp., Tucson, Ariz.
Titus Mfg. Corp., Waterloo, Ia.
Waterloo Register Co., Inc., Waterloo, Ia.

SCREENS, SUN REFLECTING

Construction Specialties, Inc., Cranford, N. J.
Federal Seaboard Terra Cotta Corp., New York, N. Y.
Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.
Kane Mfg. Corp., Kane, Pa.
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.

SCREWS, SHEET METAL

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Screw Co., Willimantic, Conn.
Anti-Corrosive Metal Products Co., Inc., Castleton-On-Hudson, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Continental Screw Co., New Bedford, Mass.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Elco Tool & Screw Corp., Rockford, Ill.
Harper Co., H. M., Morton Grove, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Holub Industries, Inc., Sycamore, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
National Lock Co., Inc., Rockford, Ill.
Paine Co., Addison, Ill.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Pheoll Mfg. Co., Inc., Chicago, Ill.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Star Stainless Screw Co., Paterson, N. J.

SCREWS, SHEET METAL, WELDING

American Screw Co., Willimantic, Conn.
Anti-Corrosive Metal Products Co., Inc., Castleton-On-Hudson, N. Y.
Continental Screw Co., New Bedford, Mass.
Ohio Nut & Bolt Co., Berea, O.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Russell, Burdsall & Ward Bolt & Nut Co., Ft. Chester, N. Y.

SEALS, SHAFT, MECHANICAL

Anchor Packing Co., Philadelphia, Pa.
Borg-Warner Mechanical Seals, Div. of Borg-Warner Corp., Los Angeles, Calif.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Cleveland Graphite Bronze, Div. of Clevite Corp., Cleveland, O.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Crane Packing Co., Morton Grove, Ill.
Felt Products Mfg. Co., Skokie, Ill.
Felters Company, The, Boston, Mass. (wool felt)
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Magnetic Seal Corp., Barrington, R. I.
Minnesota Rubber Co., Minneapolis, Minn.
Navan Products Inc., El Segundo, Calif.
Parker Seal Co., Culver City, Calif.
Rotary Seal Div., Muskegon Piston Ring Co., Chicago, Ill.
Schwitzer Corp., Indianapolis, Ind.
Sealol Corp., Providence, R. I.
Syntron Co., Homer City, Pa.
United States Gasket Co., Camden, N. J.

SEALS, TERMINAL, FOR COMPRESSORS

Lancaster Pump & Mfg. Co., Lancaster, Pa.
Minnesota Rubber Co., Minneapolis, Minn.
Navan Products Inc., El Segundo, Calif.
Parker Seal Co., Culver City, Calif.
Watsco, Inc., Hialeah, Fla.

SEAMLESS PIPE

See Pipe, Steel, Seamless

SEPARATORS, AIR

Adams Co., Inc., R. P., Buffalo, N. Y.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Binks Mfg. Co., Chicago, Ill.
Buxton Mfg. Co., Dover, N. J.
Centrifix Corp., Cleveland, O.
Clark Mfg. Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Gray Co., Inc., Minneapolis, Minn.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Harman Equipment Co., Los Angeles, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Johnson Corp., Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kice Metal Products Co., Wichita, Kans.
Kraissl Co., Inc., The, Hackensack, N. J.
Leavitt Machine Co., Orange, Mass.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Spencer Turbine Co., Hartford, Conn.
Spray Engineering Co., Burlington, Mass.
Strong, Carlisle & Hammond, Conneaut, O.
Taco Heaters, Inc., Cranston, R. I.
Trane Co., The, La Crosse, Wis.
Vortox Co., Claremont, Calif.
Watts Regulator Co., Lawrence, Mass.
Wright-Austin Co., Detroit, Mich.

SEPARATORS, BLOWDOWN

Graver Water Conditioning Co., New York, N. Y.
Wilson Engineering Corp., Chicago, Ill.

SEPARATORS, FLANGE

Kraissl Co., Inc., The, Hackensack, N. J.
Williams & Co., J. H., Buffalo, N. Y.
Wright-Austin Co., Detroit, Mich.

SEPARATORS, OIL

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Boylston Steam Specialty Co., Chicago, Ill.
Centrifix Corp., Cleveland, O. (Gas and Vapor)
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Graver Water Conditioning Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Harman Equipment Co., Los Angeles, Calif.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Hoppes Mfg. Co., Inc., Springfield, O.
Howe Ice Machine Co., Chicago, Ill.
Infilco, Inc., Tucson, Ariz.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
King Zeero Co., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Conneaut, O.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Wade Mfg. Co., Elgin, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Watkins Co., J. E., Maywood, Ill.
Worthington Corp., East Orange, N. J.
Wright-Austin Co., Detroit, Mich.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING

Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.

SEWAGE EJECTORS

See Ejectors, Sewage

SEWAGE PUMPS

See Pumps, Sewage

SHAFT SEALS, MECHANICAL

See Seals, Shafts, Mechanical

SHAFTS, FLEXIBLE, FOR CONTROL

Albertson & Co., Inc., Sioux City, Ia.
Arens Controls, Inc., Evanston, Ill.
Clark Flexible Link Shaft Co., Newton Highlands, Mass.
Healey Co., Lee, Glendale, Calif.
Piezo Mfg. Corp., Staten Island, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Stow Mfg. Co., Binghamton, N. Y.
Teleflex Industrial Products, Inc., Boyertown, Pa.

SHEARS, ELECTRICAL, PORTABLE

Beverly Shear Mfg. Co., Chicago, Ill.
Black & Decker Mfg. Co., Towson, Md.
Fenway Machine Co., Philadelphia, Pa.
Jemco Tool Corp., Seneca Falls, N. Y.
M-M-A, Inc., Lancaster, Pa.
Miller Falls Co., Greenfield, Mass.
Milton Equipment Co., Philadelphia, Pa.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Remington Arms Co., Inc., Bridgeport, Conn.
Skil Corp., Chicago, Ill.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

SHEARS, POWER

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Beverly Shear Mfg. Co., Chicago, Ill.
Buckeye Tools Corp., Dayton, O.
Buffalo Forge Co., Buffalo, N. Y. (portable)
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Cleveland Punch & Shear Works Co., Cleveland, O.
Diamond Machine Tool Co., Pico. Calif.
Famco Machine Co., Kenosha, Wis.
H-A Mfg. Co., York, Pa.
Hendley & Whittemore, Beloit, Wis.
Kling Bros. Engineering Works, Chicago, Ill. (rotary) (double angle)
Libert Machine Co., Green Bay, Wis.
Marshalltown Mfg. Co., Marshalltown, Ia.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Quickwork Div., Whiting Corp., Harvey, Ill.
Remington Arms Co., Inc., Bridgeport, Conn.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
St. Louis Tool Co., St. Louis, Mo.
Stamco Inc., New Bremen, Ohio
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Wysong & Miles Inc., Greensboro, N. C.

SHEARS AND SNIPS, HAND

Barlett Mfg. Co., Detroit, Mich.
Beverly Shear Mfg. Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Black & Decker Mfg. Co., Towson, Md. (electrically driven)
Bremil Mfg. Co., Erie, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Clauss Cutlery Co., Fremont, O.
Crescent Tool Co., Jamestown, N. Y.
Diamond Tool & Horseshoe Co., Duluth, Minn.
Fairmount Tool & Forging, Inc., Cleveland, O.
Hendley & Whittemore, Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Klenk's Aviation Snips, Wilmington, Del.
Lidseen of North Carolina, Inc., Hayesville, N. C.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Snap-on Tools Corp., Kenosha, Wis.
Thor Tool & Die Co., San Leandro, Calif.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Wiss & Sons Co., J., Newark, N. J.

SHEAVES

See Pulleys and Sheaves, for Belt Drives

SHEET METAL BRAKES

See Brakes, Sheet Metal

SHEET METAL DUCTS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL FITTINGS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL PUNCHES

See Punches, Sheet Metal

SHEETS, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
Anaconda Aluminum Co., Louisville, Ky.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Central Steel & Wire Co., Chicago, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Frasse & Co., Inc., Peter A., New York, N. Y.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (for pipe covering)
Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.
Mueller Brass Co., Port Huron, Mich.
Olin Aluminum Div., Olin Mathieson Chemical Corp., New York, N. Y.
Revere Copper and Brass, Inc., New York.
Reynolds Metals Co., Richmond, Va.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.

SHEETS, ALUMINUM COATED

Armco Steel Corp., Middletown, O.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Fairmont Aluminum Co., Fairmont, W. Va.
Rigidized Metals Corp., Buffalo, N. Y.
United States Steel Corp., Pittsburgh, Pa.

SHEETS AND BOARD, NON-METALLIC (OTHER THAN PLASTIC), FOR DUCT CONSTRUCTION

Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Celotex Corp., The, Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Met-L-Wood Corp., Chicago, Ill. (plywood composition material faced with sheet metal)
Nicolet Industries, Inc., Hamilton, O.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Ruberoid Co., New York, N. Y.
Technical Ply-Woods Sales, Chicago, Ill.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Aluminum Co. of America, Pittsburgh, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bridgeport Brass Co., Bridgeport, Conn. (laminates)
Central Steel & Wire Co., Chicago, Ill. (aluminum)
Engelhard Industries, Inc., Newark, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill. (stainless)
Lukens Steel Co. and Divisions, Coatesville, Pa.
Republic Steel Corp., Cleveland, O.
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, COPPER

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Hussey & Co., C. G., Div. of Copper Range Co., Pittsburgh, Pa.
New Haven Copper Co., The, Seymour, Conn.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (Brass, bronze, super X, phosphor bronze)
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, LEAD

Alpha Metals, Inc., Jersey City, N. J.
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., San Francisco, Calif.
Division Lead Co., Summit, Ill.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
Knapp Mills, Inc., Long Island City, N. Y.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.
Rochester Lead Wks., Inc., Rochester, N. Y.

SHEETS, MAGNESIUM ALLOY

Dow Chemical Co., The, Midland, Mich.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, METAL, WITH PROTECTIVE NON-METALLIC COATING

Bernard-Franklin Co., Inc., Philadelphia, Pa.
Bowman Steel Corp., Pittsburgh, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Ervite Corp., Erie, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Plasteel Products Corp., Washington, Pa.
Rigidized Metals Corp., Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Technical Ply-Woods Sales, Chicago, Ill. (Metal and plywood)

SHEETS, NICKEL AND NICKEL ALLOY

Bart Mfg. Corp., Belleville, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Revere Copper and Brass, Inc., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, PLASTIC, FOR DUCTS AND HOODS

Argo Plastic Products, Cleveland, O. (polyethylene, polypropylene, PVC)
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Byers Co., A. M., Pittsburgh, Pa. (Rigid PVC)
Ceilcote, Inc., Cleveland, O.
Chicago Molded Products Corp., Chicago, Ill.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (Polyvinyl chloride)
Corite Products, Inc., Chicago, Ill.
DuVerre, Inc., Buffalo, N. Y.
General Electric Co., Laminated Products Dept., Coshocton, O.
Formica Corp., The, Cincinnati, O.
Goodrich Industrial Products Co., B. F., Akron, O. (rigid)
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC)
Haveg Industries, Inc., Wilmington, Del.
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kaykor Industries, Inc., Yardville, N. J.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Laminated Sheet Products Corp., Norwood, Mass.
Molded Fiber Glass Sheet Co., Ashtabula, O.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Quelcor, Inc., Chester, Pa.
Resolite Corp., Zelienople, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Seelye Craftsmen, Inc., Minneapolis, Minn.
Seiberling Rubber Co., Plastics Div., Newcomerstown, O.
Southern Plastics Co., Columbia, S. C.
United States Gasket Co., Camden, N. J. (teflon)
United States Rubber Co., New York, N. Y.

SHEETS, STEEL, COPPER BEARING

Acme Newport Steel Co., Newport, Ky.
Alan Wood Steel Co., Conshohocken, Pa.
Armco Steel Corp., Middletown, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Granite City Steel Co., Granite City, Ill.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Republic Steel Corp., Cleveland, O.

Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, GALVANIZED

Armco Steel Corp., Middletown, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Granite City Steel Co., Granite City, Ill.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS, STEEL, GALVANNEALED

American Agile Corp., Bedford, O. (sheets plastic)
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Great Western Steel Co., Chicago, Ill.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
United States Steel Corp., Pittsburgh, Pa.

SHEETS, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh.
Armco Steel Corp., Middletown, O.
Byers Co., A. M., Pittsburgh, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless Steel Div., Detroit, Mich.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
Union Steel Corp., Union, N. J.
United States Steel Corp., Pittsburgh, Pa.
Washington Steel Corp., Washington, Pa.

SHEETS, ZINC

American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Cheney Flashing Co., Trenton, N. J.
Illinois Zinc Co., Div. of Hydrometals, Inc., Chicago, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Rigidized Metals Corp., Buffalo, N. Y.

SHIELDS, CORROSION, FOR PIPE JOINTS

Atlas Mineral Products Co., Mertztown, Pa.
Zippertubing Co., The, Los Angeles, Calif.

SHIELDS, VALVE BONNET

Industrial Products Co., Philadelphia, Pa.
Wilmington Plastics Co., Wilmington, Del.

SHOCK ABSORBERS, LIQUID

See Absorbers, shock, Liquid

SHUTTERS

See Louvers and Shutters

SIGHT GLASSES

See Glasses, Sight, for Pipe Lines

SIGNALS, LIQUID LEVEL

See Alarms, Liquid Level

SIGNALS, TANK FILL

See Alarms, Liquid Level

SILENCERS, DUCT

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems; Insulation, Duct, Sound Deadening

SILENCERS FOR REDUCING COMPRESSOR INTAKE NOISE

Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Dollinger Corp., Rochester, N. Y.
General Sound Control, Inc., Hollydale, Calif.

SIPHONS, STEAM GAGE

Chicago Nipple Mfg. Co., Oak Park, Ill.
Crane Co., Chicago, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Pittsburgh Nipple Works, Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.

SLEEVE BEARINGS

See Bearings, Sleeve

SLEEVES, PIPE REPAIR

See Clamps, Pipe Repair

SLIME AND ALGAE CONTROL, WATER TREATMENT FOR

See Treatment, Water, for Slime and Algae Control

SMOKE ALARMS

See Alarms, Smoke

SMOKE DETECTORS

See Indicators, Smoke; Alarms, Smoke

SMOKE ELIMINATORS

See Jets, Overfire Air, for Smoke Abatement

SMOKE GUNS

See Guns, Pots and Candles, Smoke and Smudge

SMOKE INDICATORS

See Indicators, Smoke

SMUDGE POTS

See Guns, Pots and Candles, Smoke and Smudge

SNOW MELTER, PORTABLE, ELECTRIC

Ampere Industries, Newark, N. J.
Heatmore, Inc., Brooklyn, N. Y.
LaSalle Products, Inc., Buffalo, N. Y.
Modernheat Cable Corp., Kingsport, Tenn.
Pyrne & Co., Inc., Pomona, Calif.
Roberson, Inc., Seattle, Wash.
Thermo Ray Corp., Newark, N. J.
Westinghouse Electric Corp., Electric Heater Div., Emeryville, Calif.
Wiegand Co., Pittsburgh, Pa.

SNOW MELTING ANTI-FREEZE

See Compounds Anti-Freeze

SOFTENERS, WATER

American Water Softener Co., Philadelphia
American Well Works, Aurora, Ill.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Norbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Duro Co., Dayton, O.
Elgin Softener Corp., Elgin, Ill.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Modern Water Equipment Co., Freeport, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Norwood Associated Engineers Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Reynolds Water Conditioning Co., Detroit, Mich.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.
Wood Mfg. Co., A. R., Luverne, Minn.

SOLAR HEAT REFLECTORS

See Canopies, Metal, Sun, Reflecting

SOLAR HEAT RESISTING LOUVERS AND SCREENS

See Louvers, Sun Reflecting; and Screens, Sun Reflecting

SOLAR SENSING INSTRUMENTS FOR HEATING AND AIR CONDITIONING

See Instruments, Solar Sensing, for Heating and Air Conditioning

SOLDER (SILVER), BRAZING ALLOYS, AND FLUXES

Aeroprojects, Inc., West Chester, Pa.
Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allen Co., Inc., L. B., Schiller Park, Ill.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alpha Metals, Inc., Jersey City, N. J.
American Platinum & Silver Div., Engelhard Industries, Inc., Newark, N. J.
American Silver Co., Flushing, N. Y.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Chemical Specialty Div. of Shooz Polish Mfg. Co., Milwaukee, Wis.
Engelhard Industries, Inc., Newark, N. J.
Eutectic Welding Alloys Corp., Flushing, N. Y.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Handy & Harman, New York, N. Y.
Hi-Grade Alloy Corp., Chicago, Ill.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Lake Chemical Co., Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
O'Reilly Engineering Co., Dallas, Tex.
Oxygen Equipment & Service Co., Chicago.
Ruby Chemical Co., Columbus, O.
Sight Feed Generator Co., West Alexandria, O.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
United Wire & Supply Corp., Cranston, R. I.
Wabash Corp., Chicago, Ill.
Weldit, Inc., Detroit, Mich.

SOLDER (TIN-LEAD), AND FLUXES

Accurate Specialties Co., Inc., Woodside, N. Y.
Aeroprojects, Inc., West Chester, Pa.
Allen Co., Inc., L. B., Schiller Park, Ill.
All-State Welding Alloys Co., Inc., White Plains, N. Y.

Alpha Metals, Inc., Jersey City, N. J.
American Sanitary Mfg. Co., Abingdon, Ill.
American Smelting & Refining Co., Federated Metals Div., New York, N. Y.
American Solder & Flux Co., Philadelphia, Pa.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Benson Co., Inc., Alex R., New Hartford, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Bohn Aluminum & Brass Corp., Detroit, Mich.
Bunker Hill Co., The. Sales & Fabrication Div., San Francisco, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Chemical Specialty Div. of Shooz Polish Mfg. Co., Milwaukee, Wis.
Division Lead Co., Summit, Ill.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Fluxolder Products Co., Detroit, Mich., (solder paints)
Gardiner Metal Co., Chicago, Ill.
Helmco, Inc., Chicago, Ill.
Hercules Chemical Co., Inc., New York, N. Y.
Hi-Grade Alloy Corp., Chicago, Ill.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Foil Mfg. Co., The, St. Louis, Mo.
Kester Solder Co., Chicago, Ill.
Klauer Mfg. Co., Dubuque, Ia.
Lake Chemical Co., Chicago, Ill. (fluxes in paste, stik & liquid form)
Lenk Mfg. Co., Franklin, Ky.
London Chemical Co., Melrose Park, Ill.
Mill-Rose Co., Cleveland, O.
Mueller Brass Co., Port Huron, Mich.
National Lead Co., New York, N. Y.
Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Revere Copper & Brass, Inc., Foil Div., Brooklyn, N. Y.
Rochester Lead Works, Inc., Rochester, N. Y.
Rotometals, San Francisco, Calif.
Ruby Chemical Co., Columbus, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

SOLENOIDS AND SOLENOID COILS

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
Automatic Switch Co., Florham Park, N. J.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dole Valve Co., The, Morton Grove, Ill.
Dormeyer Industries, Chicago, Ill.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hammett Electric Co., Kansas City, Kan.
Hubbell Corp., Mundelein, Ill.
IMC Magnetics Corp., Westbury, Long Island, N. Y.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Monitor Controller, Rockland, Mass.
National Acme Co., The, Cleveland, O.
Sporlan Valve Co., St. Louis, Mo.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Trombetta Solenoid Corp., Milwaukee, Wis.

SOLENOID VALVES

See Valves, Solenoid

SOLVENT, PENETRANT, FOR LOOSENING SCALE AND THREADED JOINTS

Cabot & Sons Co., Samuel, Boston, Mass.
Claronex Products, Inc., Brooklyn, N. Y.
Hercules Chemical Co., Inc., New York, N. Y.
Krylon, Inc., Norristown, Pa.
Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Permatex Co., Inc., Long Island, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sealed Unit Parts Co., Inc., New York, N. Y.

SOOT BLOWERS

See Blowers, Soot

SOOT DESTROYERS

See Destroyers, Soot, Chemical

SOUND ABSORBERS

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems; Insulation, Duct, Sound Deadening

SOUND ATTENUATOR BOXES

See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

SOUND CONTROL FOR COOLING TOWERS

See Noise Elimination for Cooling Towers

SOUND DEADENING FOR DUCTS

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems; Insulation, Duct, Sound Deadening

SOUND INDICATORS

See Indicators, Sound Level

SOUND TESTERS FOR LOCATING MECHANICAL TROUBLES

See Testers, Sound

SOUND TRAPS

See Absorbers, Sound, Duct Section, Prefabricated, for Noise Control in Duct Systems

SPARGER NOZZLES

See Nozzles, Sparger, for Tank Heating

SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical

SPEED REDUCERS

See Reducers, Speed

SPILLAGE SWITCH FOR SHUTTING OFF GAS BURNER

See Switches, Flue Spillage, for Shutting Off Gas Burner

SPIRAL PIPE

See Pipe, Spiral Welded

SPIRAL PIPE FOR HIGH VELOCITY AIR SYSTEMS

See Ducts, Spiral Welded

SPLIT SYSTEMS

See Unitary Air Conditioners

SPOT WELDERS

See Welders, Spot

SPRAY HUMIDIFIERS

See Humidifiers, Direct, Spray Head

SPRAY NOZZLES

See Nozzles, Spray

SPRAY PAINTING BOOTHS

See Booths, Painting, Spray

SPRINKLER HEADS

See Heads, Sprinkler

SPRINKLER SYSTEM CONTROLS

See Controls, Fire Protection Sprinkler System; Valves, Fire Protection Sprinkler System Control

SPRINKLERS FOR FIRE PROTECTION

See Heads, Sprinkler

STACKS AND CHIMNEYS, INDUSTRIAL, PREFABRICATED

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
Bigelow Co., The, New Haven, Conn.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Metal Mfg. Co., Chicago, Ill.
Chicago Steel Tank Co., Div. of U.S. Industries, Inc., Chicago, Ill.
Condensation Engineering Corp., Chicago, Ill.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
General Products Co., Inc., Fredericksburg, Va.
Hodge Boiler Wks., East Boston, Mass.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kellogg Co., M. W., The, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Leffel & Co., James, The, Springfield, O.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
McQuay, Inc., Minneapolis, Minn.
Shutt Process Equipment Corp., St. Louis, Mo.
Smith Corp., A. O., Milwaukee, Wis.
Van-Packer Co., Div. of the Flintkote Co., Chicago Heights, Ill.
Winnen Incinerator Co., Bedford, O.

STAINLESS STEEL PIPE

See Pipe, Steel, Stainless

STAINLESS STEEL SHEETS

See Sheets, Steel, Stainless

STANDS, PIPE VISE

American Pipe Tool Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Erie Tool Wks., Erie, Pa.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Martin & Sons, H. P., Owensboro, Ky.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Wickliffe, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y.

STANDS, TANK

Acme Steel Co., Chicago, Ill. (slotted angle)
Acme Welding Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
Basic Engineers, Inc., Sharpsburg, Pa.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Old Dominion Iron & Steel Corp., Richmond, Va.
Yuba Mfg. Div., Yuba Consolidated Industries Inc., Benicia, Calif.

STAPLES FOR FASTENING TUBING

See Hangers and Supports, Pipe

STARTERS, MOTOR

See Controllers and Starters, Motor

STEAM BOOSTER COMPRESSORS

See Compressors, Steam Booster

STEAM ENGINES

See Engines, Steam

STEAM GENERATORS

See Boilers

STEAM JET HEATERS

See Heaters, Steam Jet, for Liquids

STEAM JET REFRIGERATION

See Compressors, Refrigerating, Steam Jet

STEAM PRESSURE REGULATORS

See Valves, Pressure Reducing and Regulating

STEAM PUMPS

See Pumps, Steam

STEAM SEPARATORS
See Separators, Steam and Oil

STEAM TRAPS
See Traps, Steam

STEEL PIPE
See Pipe, Steel

STEEL TUBE FITTINGS, FLARED
See Fittings, Steel Tube, Flared

STEEL TUBING
See Tubing, Steel

STEEL UNIONS
See Unions, Steel

STEEL VALVES
See Valves, Gate; and Valves, Globe

STERILIZING LAMPS
See Lamps, Sterilizing, for Duct Installation

STERILIZING UNITS
See Units, Sterlizing, Air

STOCKS AND DIES
American Pipe Tool Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Champion Blower & Forge Co., Lancaster, Pa.
Erie Tool Wks., Erie, Pa.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Mercury Hydraulics, Inc., Denver, Colo.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Wickliffe, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Thor Tool & Die Co., San Leandro, Calif.
Threadwell Tap & Die Co., Greenfield, Mass.
Toledo Pipe Threading Machine Co., Toledo, O.

STOKERS, INDUSTRIAL AND COMMERCIAL
61 *to* 1200 *Lb per Hr.*

Allington & Curtis Mfg. Co., Saginaw, Mich. (For shavings, chips and sawdust)
American Coal Burner and Wood Stoker Corp., Chicago, Ill. (solid fuels combination system)
American Engineering Co., Philadelphia, Pa. (underfeed, spreader)
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Heating Div., Auburn, Ind. (Worm feed, 61 to 850 lb per hr; hydraulic ram 450 to 2500 lb per hr)
Automatic Solid Fuels Equipment Inc., Indianapolis, Ind.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bros. Inc., Minneapolis, Minn.
Canton Stoker Corp., Canton. O.
Carnes, Inc., John R., Lima, O.
Carpenter Heating & Air Conditioning Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Dayton Automatic Stoker Co., Dayton, O.
Detroit Stoker Co., Monroe, Mich. (3000 lb coal per hr to 400,000 lb steam per hr)
Electric Furnace-Man, Inc., Emmaus, Pa. (wet grate, and 61 and 85 lb round retort stokers)
Erie City Iron Works, Erie, Pa.
Flynn & Emrich Co., Baltimore, Md.
Frederick Iron & Steel Inc., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Gross-Aire Mfg. Co., Overland, Mo.
Heating Assurance, Inc., Spokane, Wash.
Hershey Motorstoker, Manheim, Pa. (repair parts for all motorstokers)
Hoffman Combustion Engrg. Co., Lincoln Park, Mich. (spreader type; 10,000 to 500,000 lb per hr)
Iron Fireman Mfg. Co., Cleveland, O. (underfeed)
Johnston & Jennings Co., Cleveland, O. (chain grate)
Kol-Master Corp., Oregon, Ill.
Laclede Stoker Co., St. Louis, Mo. (chain grate, spreader) (over 1200 lb per hr)
Leffel & Co., James, Springfield, O.
Meyer Furnace Co., The, Peoria, Ill.
Ormsby-Osterman, Inc., St. Louis, Mo.
Riley Stoker Corp., Worcester, Mass.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Sun-Fire Stoker Corp., New Albany, Ind. (Hopper)
V. & E. Products, Inc., Schuylkill Haven, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiting Fire Power Products Corp., Superior, Wis.
Whitty Co., Inc., Boston, Mass. (Bituminous)
Will-Burt Co., The, Orrville, O.
Worley Equipment, Inc., Chicago, Ill.

STONEWARE PIPE
See Pipe, Stoneware

STORAGE WATER HEATERS
See Heaters, Water, Steam, Storage

STORE TYPE AIR CONDITIONERS
See Unitary Air Conditioners, Summer, Store Type

STRAINERS, PIPE LINE
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Airaterra (Roylyn Products), Glendale, Calif.
Airmatic Valve, Inc., Cleveland, O.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Newtonville, Mass. (steam and water only)
Barrett Haentjens & Co., Hazleton, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Boylston Steam Specialty Co., Chicago, Ill.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Clayton Mark & Co., Evanston, Ill.
Coen Co., San Francisco, Calif.
Cooper Alloy Corp., Hillside, N. J.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago, Ill.
Cuno Engineering Corp., Meriden, Conn.
Davis Regulator Co., Chicago, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeZurik Corp., Sartell, Minn.
Eddington Metal Specialty Co., Eddington, Pa.
Edward Valves, Inc., East Chicago, Ind.
Elliott Co., Jeannette, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
General Ceramics Corp., Keasbey, N. J. (ceramic)
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Granberg Corp., Oakland, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Hays Mfg. Co., Erie, Pa.
Henry Valve Co., Melrose Park, Ill.
Hetherington & Berner, Inc., Indianapolis, Ind. (jacketed)
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Josam Mfg. Co., Michigan City, Ind.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
L. R. P., Inc., Leicester, N. Y.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Morrison Brothers Co., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Inc., Brooklyn, N. Y.
Newark Wire Cloth Co., Newark, N. J.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Nugent & Co., Inc., Wm. W., Skokie, Ill.
OPW-Jordan, Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Phillips & Co., H. A., Chicago, Ill.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Plant Engineering & Equipment Co., Elizabeth, N. J.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliable Products Mfg. Co., Inc., Brooklyn, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Ronningen-Petter Co., Vicksburg, Mich.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Burlington, Mass.
Spraying Systems Co., Bellwood, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Staples & Pfeiffer, San Francisco, Calif.
Steinen Mfg. Co., Wm., Newark, N. J.
Sterling, Inc., Milwaukee, Wis.
Strong, Carlisle & Hammond, Conneaut, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Velan Valve Corp., Plattsburgh, N. Y.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
Zurn Industries, Inc., Erie, Pa.

STRAINERS, REFRIGERANT, LIQUID LINE
A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Elkhart Products Corp., Elkhart, Ind.
General Controls Co., Glendale, Calif.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Refrigerating Specialties Co., Chicago, Ill.
Refrigeration Research, Inc., Brighton, Mich.
Ronningen-Petter Co., Vicksburg, Mich.
Sealed Unit Parts Co., Inc., New York, N. Y.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Sporlan Valve Co., St. Louis, Mo.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Velan Valve Corp., Plattsburgh, N. Y.
Wabash Corp., Chicago, Ill.
Watsco, Inc., Hialeah, Fla.
Zurn Industries, Inc., Erie, Pa.

STRAINERS, SUCTION, FOR AIR WASHERS
Eddington Metal Specialty Co., Eddington, Pa.
Keckley Co., O. C., Skokie, Ill.

Kraissl Co., Inc., The, Hackensack, N. J.
Milwaukee Valve Co., Milwaukee, Wis.
Newark Wire Cloth Co., Newark, N. J.
Ronningen-Petter Co., Vicksburg, Mich.
Staples & Pfeiffer, San Francisco, Calif.
Water Cooling Corp., New York, N. Y.
Zurn Industries, Inc., Erie, Pa.

STRESS RELIEVERS

See Preheaters and Stress Relievers, Electric, for Pipe Welds

STRIP HEATERS

See Heaters, Strip and Immersion, Electric

STRUCTURAL SHAPES

See Angles, Bars, Beams, Channels and Tees

STUD DRIVERS

See Fasteners, Powder Operated

STUD WELDERS

See Welders, Stud

SUCTION LINE HEAT EXCHANGERS

See Exchangers, Heat, Refrigerant Suction Line

SUMP PUMPS

See Pumps, Sump

SUPERHEATERS, PROCESS STEAM

Alstrom Corp., New York, N. Y.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Bros Inc., Minneapolis, Minn.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Electro-Therm, Inc., Silver Spring, Md.
Erie City Iron Works, Erie, Pa.
Foster Wheeler Corp., New York, N. Y.
Murray Iron Wks. Co., Burlington, Ia.
Pantex Mfg. Corp., Pawtucket, R. I.
Springfield Boiler Co., Springfield, Ill.
Tranter Mfg. Inc., Lansing, Mich.
Union Iron Works. Erie, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SURFACE, FINNED, COOLING, BRINE

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American-Standard Industrial Div., Detroit, Mich.
Anderson-Snow Corp., Chicago, Ill.
Blazer & Son, M., Passaic, N. J.
Drayer-Hanson, Div. of National U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York. Pa.
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Recold Corp., Los Angeles, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Super Radiator Corp., Minneapolis, Minn.
Temtrol, Inc., Okarche, Okla.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, COLD WATER

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American-Standard Industrial Div., Detroit.
Anderson-Snow Corp., Chicago, Ill.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, **Pittsburgh, Pa.**
Hastings Air Control, Inc., **Omaha, Nebr.**
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
Industrial Products Div., Perfex Corp., Milwaukee, Wis.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Magic Aire Div., United Electric Co., Wichita Falls, Tex.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
National-U.S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., **New York, N. Y.**
Peerless of America, Inc., Chicago, Ill.
Recold Corp., Los Angeles, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Super Radiator Corp., Minneapolis, Minn.
Temtrol, Inc., Okarche, Okla.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Tubenfin Coil Co., Houston, Tex.
United States Air Conditioning Corp., Delaware, O.
Vilter Mfg. Co., Milwaukee, Wis.
Wescott Snyder Mfg. Corp., Madison, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Witt Co., A. H., **Los Angeles, Calif.**
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American-Standard Industrial Div., Detroit.
Anderson-Snow Corp., Chicago, Ill.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders Corp., Buffalo, N. Y.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Nebr.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Imeco, Inc., Chicago, Ill.
Industrial Products Div., Perfex Corp., Milwaukee, Wis.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Magic Aire Div., United Electric Co., Wichita Falls, Tex.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Recold Corp., Los Angeles, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Super Radiator Corp., Minneapolis, Minn.
Temtrol, Inc., Okarche, Okla.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Tubenfin Coil Co., Houston, Tex.
United States Air Conditioning Corp., Delaware, O.
Vilter Mfg. Co., Milwaukee, Wis.
Watkins Co., J. E., **Maywood, Ill.**
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Witt Co., A. H., **Los Angeles, Calif.**
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, ELECTRIC HEATING ELEMENT

Blazer & Son, M., Passaic, N. J.
Marlo Coil Co., St. Louis, Mo.
Roberson, Inc., Seattle, Wash.
Waage Electric, Inc., Kenilworth, N. J.
Wiegand Co., E. L., Pittsburgh, Pa.
Wilson Electric Furnace Co., Rossville, Ga.

SURFACE, FINNED, HEATING

Also See Radiation; Pipe, Finned; Tubing, Finned

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING

Blazer & Son, M., **Passaic, N. J.**
Clarage Fan Co., Kalamazoo, Mich.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
National-U.S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rome-Turney Radiator Co., Rome, N. Y.
Temtrol, Inc., Okarche, Okla.
Trane Co., The, LaCrosse, Wis.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

Anderson-Snow Corp., Chicago, Ill.
Bayley Blower Co., Milwaukee, Wis.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders Corp., Heating Div., Trenton, N. J.
Griscom-Russell Co., The, Massillon, O.
Imeco, Inc., Chicago, Ill.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Marlo Coil Co., St. Louis, Mo.

McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Moore Dry Kiln Co., Jacksonville, Fla.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., Johnstown.
New York Blower Co., Chicago, Ill.
Recold Corp., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

Aerofin Corp., Syracuse, N. Y.
American-Standard Industrial Div., Detroit.
Anderson-Snow Corp., Chicago, Ill.
Bayley Blower Co., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Neb.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Imeco, Inc., Chicago, Ill.
Industrial Products Div., Perfex Corp., Milwaukee, Wis.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lewis & Saunders, Inc., Lakeport, N. H.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Recold Corp., Los Angeles, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Super Radiator Corp., Minneapolis, Minn.
Temtrol, Inc., Okarche, Okla.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Tubenfin Coil Co., Houston, Tex.
United States Air Conditioning Corp., Delaware, O.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Wescott Snyder Mfg. Corp., Madison, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Witt Co., A. H., Los Angeles, Calif.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE THERMOSTATS

See Thermostats, Surface

SUSPENDED FURNACES

See Heaters, Air

SWING JOINTS

See Joints, Pipe, Flexible Swing and Revolving

SWITCHES, ELECTRICAL

Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Adam Electric Co., Frank, St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Switch Co., Florham Park, N. J.
Barber-Colman Co., Rockford, Ill.
Better Engineered Controls, Los Angeles, Calif.
Circuit Protective Devices Dept., General Electric Co., Plainville, Conn. (safety)
Clark Controller Co., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Distribution Equipment Div., Lexington, Ky.
Divac Div., Acme Machine Works, Hawthorne, Calif.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
Essex Wire Corp., Ft. Wayne, Ind.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Appliance Control Dept., Morrison, Ill.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
General Electric Co., Wiring Device Dept., Providence, R. I.
Goodwill Mfg. Co., Chicago, Ill.
Guardian Electric Mfg. Co., Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hammett Electric Co., Kansas City, Kans.
Hart Mfg. Co., Hartford, Conn.
Haydon Co., A. W., Waterbury, Conn.
Heinemann Electric Co., Trenton, N. J.
I-T-E Circuit Breaker Co., Philadelphia, Pa.
Kulka Electric Corp., Mt. Vernon, N. Y.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller, Rockland, Mass.
Morse-Smith-Morse, Inc., Watertown, Mass.
National Acme Co., The, Cleveland, O.
Parish Co., New Orleans, La.
Penn Controls, Inc., Goshen, Ind.
Pyle-National Co., The, Chicago, Ill.
Reynolds Electric Co., River Grove, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass. (precision)
Tuttle Electric Products, Inc., Kirkland, Ill.
Unimax Switch Div., W. L. Maxson Corp., Wallingford, Conn.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wind-Way Fan & Ventilator Co., New Orleans, La. (fire fuse)
Zell-Aire Corp., Reading, Pa.
Zenith Electric Co., Chicago, Ill.

SWITCHES, FLOAT, REFRIGERATION

Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Clark Controller Co., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Frick Co., Waynesboro, Pa.
Furnas Electric Co., Batavia, Ill.
Magnetrol, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.

SWITCHES, FLOW

Barton Instrument Corp., Monterey Park, Calif.
Cleveland Controls, Inc., Cleveland, O.
Cook Electric Co., Chicago, Ill.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Drying Systems Co., Chicago, Ill. (air)
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hays Mfg. Co., Erie, Pa.
Instruments, Inc., Tulsa, Okla.
Magnetrol Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.

SWITCHES, FLUE SPILLAGE, FOR SHUTTING OFF GAS BURNER

Cleveland Controls, Inc., Cleveland, O.
Wilson Industries, Inc., Brooklyn, N. Y.

SWITCHES, GAS DENSITY

Newark Controls Co., Bloomfield, N.J.

SWITCHES, LIQUID LEVEL

Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Control Co., St. Paul, Minn.
Automation Products, Inc., Houston, Tex.
Barton Instrument Corp., Monterey Park, Calif.
Chicago Pump Co., Subsid. of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clark Controller Co., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Electronics Corp. of America, Cambridge, Mass.
Fischer & Porter Co., Hatboro, Pa.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Mfg. Co., Erie, Pa.
Healy Ruff Co., St. Paul, Minn.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Instruments, Inc., Tulsa, Okla.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Controls, Inc., Goshen, Ind.
Petrometer Corp., Long Island City, N. Y.
Scaico Controls Inc., Delanco, N. J.
Schaub Engineering Co., Fred H., Chicago, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Watkins Co., J. E., Maywood, Ill.
Westinghoue Electric Corp., Pittsburgh, Pa.

SWITCHES, MERCURY

Automatic Timing & Controls, Inc., King of Prussia, Pa.
Ebert Electronics Corp., Queens Village, N. Y.

G. M. Mfg. Co., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
General Electric Co., Wiring Device Dept., Providence, R. I.
H-B Instrument Co., Philadelphia, Pa.
Mercoid Corp., Chicago, Ill.
Micro Switch Div. of Minneapolis-Honeywell Reg. Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, PNEUMATIC

Allen-Bradley Co., Milwaukee, Wis.
Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Johnson Service Co., Milwaukee, Wis.
Magnetrol, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Scaico Controls Inc., Delanco, N. J.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.

SWITCHES, PRESSURE AND VACUUM

Allen-Bradley Co., Milwaukee, Wis.
American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Control Co., St. Paul, Minn.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barksdale Valves, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Cleveland Controls, Inc., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Cooper Hewitt Electric Co., Div. of Sperti-Faraday, Inc., Hoboken, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Dewey Gas Furnace Co., Detroit, Mich.
Dietz Co., Inc., Henry G., Long Island City, N. Y.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Furnas Electric Co., Batavia, Ill.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Healy Ruff Co., St. Paul, Minn.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nason Co., Clarkston, Mich.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Rochester Mfg. Co., Inc., Rochester, N. Y
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Scully Signal Co., Melrose, Mass.
Shallcross Controls, Inc., Markesan, Wis.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Synchro-Start Products, Inc., Skokie, Ill.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.

SWITCHES, TIME

Aemco Inc., Mankato, Minn.
A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Allen-Bradley Co., Milwaukee, Wis.
April Showers Co., Inc., Washington, D. C.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Cincinnati Time Recorder Co., Cincinnati, O.
Cissell Mfg. Co., W. M., Louisville, Ky.
Cleveland Controls, Inc., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cramer Controls Corp., Centerbrook, Conn.
Cutler-Hammer, Inc., Milwaukee, Wis.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Electronics Corp. of America, Cambridge, Mass.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Co., Kansas City, Kans.
Hansen Mfg. Co., Princeton, Ind. (timing motors and time machine)
Haydon Co., A. W., Waterbury, Conn.
Haydon Div., General Time Corp., Torrington, Conn.
Heat-Timer Corp., New York, N. Y.
International Register Co., Chicago, Ill.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Paragon Electric Co., Two Rivers, Wis.
Partlow Corp., The, New Hartford, N. Y.
Ranco Incorporated, Columbus, O.
Reliance Automatic Lighting Co., Racine, Wis.
Rhodes, Inc., M. H., Hartford, Conn.
Sangamo Electric Co., Springfield, Ill.
Sarcotherm Controls., Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Stromberg Time Control, Thomaston, Conn.
Telechron Timers and Motors, Clock & Timer Dept., General Electric Co., Ashland, Mass.
Tork Time Controls, Inc., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

SWIVEL PIPE COUPLINGS

See Joints, Pipe, Flexible Swing and Revolving

SYSTEMS, COMBUSTION CONTROL

Ace Instrument Co., Inc., Brooklyn, N. Y.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Controls, Inc., Cleveland, O.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foster Wheeler Corp., New York, N. Y.
GPE Controls, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Leahy Mfg. Co., Los Angeles, Calif.
Leeds & Northrup Co., Philadelphia, Pa.
Lientz Co., B. P., Kansas City, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Photomation, Inc., Bergenfield, N. J.
Protection Controls, Inc., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Roth Co., Roy E., Rock Island, Ill.
Shallcross Controls, Inc., Markesan, Wis.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
White-Rodgers Co., St. Louis, Mo.

SYSTEMS, CONDENSATE RETURN

Acker Corp., Meridian, Miss.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Decatur Pump Co., Decatur, Ill.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Johnson Corp., The, Three Rivers, Mich.
Kaiser Co., E. B., Glenview, Ill.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Liqui-Therm Co., Brookfield, Wis.
Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
Sarco Co., Inc., New York, N. Y.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stout & Sons, David, St. Louis, Mo.
Weil Pump Co., Chicago, Ill.
York-Shipley, Inc., York, Pa.

SYSTEMS, ELECTRIC PIPE HEATING

Fluid Systems, Inc., New Haven, Conn.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Hammett Electric Co., Kansas City, Kans.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Trent, Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

Allen Mfg. Co., W. D., Bellwood, Ill.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Cardox Corp., Chicago, Ill.
Cincinnati Time Recorder Co., Cincinnati, O.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Fyr-Fyter Co., Dayton, O. (carbon dioxide; dry chemical; foam)
Grinnell Co., Inc., Providence, R. I.
Heat-Timer Corp., New York, N. Y.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Mearlcrete Div., Mearl Mfg. Corp., Roselle Park, N. J.
Miller-Harris Instrument Co., Milwaukee, Wis.
Photobell Co., Inc., New York, N. Y.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Sperti Faraday, Inc., Adrian, Mich.
Worner Electronic Devices, Rankin, Ill.

SYSTEMS, HEATING, HIGH TEMPERATURE HOT WATER

Over 350 F

American Hydrotherm Corp., Long Island City, N. Y.
Buxton Mfg. Co., Dover, N. J.
Combustion Engineering Inc., New York, N. Y.
International Boiler Works, The, East Stroudsburg, Pa.
Kaiser Co., E. B., Glenview, Ill.

Preferred Utilities Mfg. Corp., New York, N. Y.
Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.

SYSTEMS, HEATING, HOT WATER

Bell & Gossett Co., Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kaiser Co., E. B., Glenview, Ill.
Nesbitt, Inc., John J., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A. Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Michigan City, Ind.

SYSTEMS, HEATING, VACUUM

Barnes & Jones, Inc., Newtonville, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, VAPOR

Barnes & Jones, Inc., Newtonville, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Monash Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING AND VENTILATING, GAS OR OIL FIRED, WARM AIR, FOR SCHOOL CLASSROOMS

American Foundry & Furnace Co., Bloomington, Ill.
Lennox Industries Inc., Des Moines, Ia.
Norman Products Co., Inc., Columbus, O.

SYSTEMS, HEATING, ZONE CONTROL

Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Thrush & Co., H. A., Peru, Ind.
Weil-McLain Co., Michigan City, Ind.
White-Rodgers Co., St. Louis, Mo.
Zone-Heat Regulator Co., Garrettsville, O.

SYSTEMS, HOT GAS DEFROSTING, FOR REFRIGERATION

Blazer & Son, M., Passaic, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McQuay, Inc., Minneapolis, Minn.
Recold Corp., Los Angeles, Calif.
Refrigerating Specialties Co., Chicago, Ill.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

SYSTEMS, PROCESS HEATING, HIGH TEMPERATURE

American Hydrotherm Corp., Long Island City, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Dow Chemical Co., The, Midland, Mich.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Foster Wheeler Corp., New York, N. Y.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
International Boiler Works, The, East Stroudsburg, Pa.
Kaiser Co., E. B., Glenview, Ill.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Peabody Engineering Corp., New York, N. Y.
Reznor Mfg. Co., Mercer, Pa.
Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sarcotherm Controls, Inc., New York, N. Y.
Struthers Wells Corp., Warren, Pa.
Trent, Inc., Philadelphia, Pa.

SYSTEMS, ROOF SPRAYING (FOR COOLING ROOFS)

April Showers Co., Inc., Washington, D. C.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Muellermist Irrigation Co., Maywood, Ill.
Ruppright's Rotary Roof Cooler, Los Angeles, Calif.
Spray Engineering Co., Burlington, Mass.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

TABLES, BENDING, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.

TACHOMETERS

Boulin Instrument Corp., Pelham, N. Y.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
EPIC, Inc., New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.

TAGS, VALVE, FOR IDENTIFYING VALVES

Acromark Co., Elizabeth, N. J.
Atlantic Engravers, Wilmington, Vt.
Better Engineered Controls, Los Angeles, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Meyer & Wenthe, Inc., Chicago, Ill.
Seton Name Plate Co., New Haven, Conn.

TANK CLEANING COMPOUNDS

See Compounds, Cleaning, Tank

TANK FITTINGS

See Fittings and Bushings, Fuel Oil Tank; Alarms, Liquid Level

TANK HEADS

See Parts, for Heating and Air Conditioning Equipment

TANK LININGS

See Coating, Protective, for Metals

TANKS, BLOWOFF

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
Bethlehem Steel Co., Bethlehem, Pa.
Bigelow Co., The, New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros, Inc., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Ellicott Fabricators, Inc., Baltimore, Md.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler Co., Portland, Ore.
Graver Water Conditioning Co., New York, N. Y.
Hodge Boiler Wks., East Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Works Co., The, East Stroudsburg, Pa.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Lucey Boiler & Mfg. Corp., Chattanooga, Ill.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Morrison Brothers Co., Dubuque, Ia.
Nooter Corp., St. Louis, Mo.
Old Dominion Iron & Steel Corp., Richmond, Va.
Parker Boiler Mfg. Co., Sid. E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Richmond Engineering Co., Richmond, Va.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Union Iron Works, Erie, Pa.
Water Tube Boiler & Tank Co., Chicago, Ill.

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Adsco Div., Yuba Consolidated Industries. Inc., Buffalo, N. Y.
American Tube Products, Inc., West Warwick, R. I. (pressurized)
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Bell & Gossett Co., Morton Grove, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Biggs Boiler Works Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Ellicott Fabricators, Inc., Baltimore, Md.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler Co., Portland, Ore.
General Automatic Products Corp., Baltimore, Md.
Hoffman Specialty Mfg. Corp., Indianapolis. Ind.
International Boiler Works Co., The, East Stroudsburg, Pa.
Koven & Bro. Inc., L. O., Jersey City, N. J.
Morrison Brothers Co., Dubuque, Ia.
Old Dominion Iron & Steel Corp., Richmond, Va.
Parker Boiler Mfg. Co., Sid. E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Scaife Co., Oakmont, Pa.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Union Iron Wks., Erie, Pa.
Water Tube Boiler & Tank Co., Chicago, Ill.
Western Blower Co., Seattle, Wash.
Wood Co., John, Conshohocken, Pa.

TANKS, PROCESS AND STORAGE

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Adsco Div., Yuba Consolidated Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Allcraft Mfg. Co., Inc., Cambridge, Mass.
Aluminum Co. of America, Pittsburgh, Pa.
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.

American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber lined)
American Meter Co., Pump Div., Philadelphia, Pa.
American Pipe & Steel Corp., Alhambra, Calif.
Apex Reinforced Plastics, Cleveland, O.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Argo Plastic Products, Cleveland, O.
Atlas Mineral Products Co., Mertztown, Pa.
Barnstead Still & Fertilizer Co., Boston, Mass.
Beaird Co., J. B., Shreveport, La.
Bell & Gossett Co., Morton Grove, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Bigelow Co., New Haven, Conn.
Biggs Boiler Wks. Co., E. Akron, O.
Binks Mfg. Co., Chicago, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bishopric Products Co., Cincinnati, O.
Bros, Inc., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Bridge & Iron Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (plastic)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Corite Products, Inc., Chicago, Ill. (plastic)
David-Ludwig Co., Detroit, Mich.
Day Co., The, Minneapolis, Minn.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elastic Porcelain Lining Corp., Rochester, N. Y. (Tank linings)
Electro-Chemical Products Corp., Cleveland, O. (PVC plastic; lined or self-supporting)
Ellicott Fabricators, Inc., Baltimore, Md.
Erie City Iron Wks., Erie, Pa.
Falstrom Co., Passaic, N. J.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Fluor Products Co., Santa Rosa, Calif.
Frick Co., Waynesboro, Pa.
Gabriel Boiler Co., Portland, Ore.
Galloway Co., G. W., Arcadia, Calif.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware, plastic, & porcelain)
General Fittings Co., East Greenwich, R. I.
Goodrich Industrial Products Co., Akron, O. (Rubber lined)
Hanson Equipment Co., Beloit, Wis. (plastic)
Haveg Industries, Inc., Wilmington, Del.
Heil Process Equipment Corp., Cleveland, Ohio
Hodge Boiler Works, East Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
International Boiler Wks., The, East Stroudsburg, Pa.
International Engineering, Inc., Dayton, O.
Kaustine Furnace & Tank Corp., Perry, N. Y.
Kellogg Co., M. W., The, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knapp Mills, Inc., Long Island City, N. Y.
Knight, Maurice A., Akron, O. (acid-proof, lined steel)
Kopperman & Sons, Inc., Joseph, Philadelphia, Pa.
Koven & Bro. Inc., L. O., Jersey City, N. J.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rubber PVC lined)
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined and all lead)
Littleford Bros. Inc., Cincinnati, O.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Metalweld, Inc., Industrial Maintenance Div., Philadelphia, Pa.
Morrison Brothers Co., Dubuque, Ia.
Newcomb-Detroit Co., Detroit, Mich.
Nooter Corp., St. Louis, Mo.
Old Dominion Iron & Steel Corp., Richmond, Va.
Parker Boiler Mfg. Co., Sid. E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (glass)
Portland Copper & Tank Works, Inc., South Portland, Me.
Quaid Fabrications, Inc., Palmyra, N. J.
Quaker City Iron Wks., Philadelphia, Pa.
Quelcor, Inc., Chester, Pa.
Queen City Engineering Co., Charlotte, N. C.
Reco Products Div., Recony Corp., New York, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Rosebraugh Co., W. W., Salem, Ore.
Roth Co., Roy E., Rock Island, Ill.
S & C Mfg. Co., Cincinnati, O. (plastics)
Scaife Co., Oakmont, Pa.
Sims Co., Erie, Pa.
Smith Corp., A. O., Milwaukee, Wis.
Spurgeon Co., Warren, Mich.
Structural Fibers, Inc., Chardon, O. (plastic fiberglass reinforced)
Struthers Wells Corp., Warren, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.
United Sheet Metal Co., Inc., Columbus, O.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Van Noorden Co., E., Boston, Mass.
Water Tube Boiler & Tank Co., Chicago, Ill.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Wood Co., John, Conshohocken, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.
Zingheim Co., William C., Chicago, Ill.

TAPE, DUCT, ADHESIVE, FOR SEALING JOINTS

Adhesive Tape Corp., Brooklyn, N. Y.
Arno Adhesive Tapes, Inc., Michigan City, Ind.
Cain Mfg. Inc., Birmingham, Ala.
Continental Tapes, Cayce, S. C.
Durkee-Atwood Co., Minneapolis, Minn.
Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Dutch Brand Div., Johns-Manville Corp., Chicago, Ill.
Goodrich Industrial Products Co., B. F., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Industrial Tape Div., Hampton Mfg. Co., New Rochelle, N. Y.
Johns-Manville, New York, N. Y.
Kendall Co., Polyken Sales Div., Chicago, Ill.
Miracle Adhesives Corp., Bellmore, N. Y.
Mortell Co., J. W., Kankakee, Ill.
Mystik Adhesive Products, Inc., Chicago, Ill.
Permacel, New Brunswick, N. J.
Seamless Rubber Co., The, Industrial Tape Div., New Haven, Conn.
Technical Tape Corp., New Rochelle, N. Y.
Tropical Tape Div., Ft. Lauderdale, Fla.

TAPE, INDUSTRIAL, ADHESIVE

Adhesive Tape Corp., Brooklyn, N. Y.
Arno Adhesive Tapes, Inc., Michigan City, Ind.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
By-Buk Co., Los Angeles, Calif.
Cain Mfg. Inc., Birmingham, Ala.
Chemtrol, Lynwood, Calif. (pipe sealant)
Continental Hard Rubber Co., New Haven, Conn.
Continental Tapes, Cayce, S. C.
Corbman Bros., Inc., Philadelphia, Pa.
Dayton Rubber Co., Dayton, O.
Durkee-Atwood Co., Minneapolis, Minn.
Dutch Brand Div., Johns-Manville Corp., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Gerrard & Co., A. J., Melrose Park, Ill.
Goodrich Industrial Products Co., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Kendall Co., Polyken Sales Div., Chicago, Ill.
Labelon Tape Co., Inc., Rochester, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., St. Paul, Minn.
Mystik Adhesive Products, Inc., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Norton Co., Worcester, Mass.
Pam Narrow Fabrics Co., Oceanside, N. Y. (asbestos for pipe wrappings)
Pee Cee Tape & Label Co., Los Angeles, Calif. (Printed)
Permacel, New Brunswick, N. J.
Porter Co., Inc., H. K., Thermoid Div., Philadelphia, Pa.
Products Research Co., Los Angeles, Calif.
Rubber & Plastics Compound Co., New York, N. Y. (vinyl and polyethylene)
Seamless Rubber Co., The, Industrial Tape Div., New Haven, Conn.
Spring Packing Corp., Chicago, Ill.
Tropical Tape Div., Ft. Lauderdale, Fla.
United Mineral & Chemical Corp., New York.
United States Rubber Co., New York, N. Y.

TAPS, PIPE

Cain Mfg. Inc., Birmingham, Ala.
DoAll Co., The, Des Plaines, Ill.
Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.

TELESCOPES, FOR INSPECTING PIPE AND OTHER EQUIPMENT

A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., Pelham Manor, N. Y.
Eder Instrument Co., Chicago, Ill.

TELEVISION, INDUSTRIAL, CLOSED-CIRCUIT

Diamond Power Specialty Corp., Lancaster, O.
Radio Corp. of America, Industrial Electronic Products, Camden, N. J.

TEMPERATURE AND HUMIDITY CONTROLS

See Humidistats; Recorder-Controllers; Thermostats; Regulators, Temperature

TEMPERATURE RECORDERS

See Recorders, Temperature

TEMPERATURE REGULATORS

See Regulators, Temperature

TEMPLATES, DRAWING, PIPING

Alco Products, Inc., Schenectady, N. Y.
Dietzgen Co., Eugene, Chicago, Ill.
Graphic Indicator Co., Los Angeles, Calif. (indicators for valves, piping)

TEST CHAMBERS

See Chambers, Test, Controlled Temperature and Humidity

TESTERS, DUST SPOT, FOR AIR FILTERS

Gelman Instrument Co., Chelsea, Mich.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Research Appliance Co., Allison Park, Pa.
Trerice Co., H. O., Detroit, Mich.

TESTERS, GAGE, DEAD WEIGHT

American Instrument Co., Inc., Silver Spring, Md.
Crosby Valve & Gage Co., Wrentham, Mass.
Dynametrics Corp., Burlington, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Inc., Cleveland, O.
Trerice Co., H. O., Detroit, Mich.

TESTERS, LEAK, FOR PIPING AND VESSELS

Airserco Mfg. Co., Pittsburgh, Pa.
American Gas & Chemical, Inc., Leak-Tec Div., New York
American Pipe & Steel Corp., Alhambra, Calif.
Chicago Forging and Mfg. Co., Chicago, Ill.
Dudgeon, Inc., Richard, Brooklyn, N. Y.

Farris Engineering Co., Palisades Park, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Johnson-Williams, Inc., Palo Alto, Calif.
Mechanical Products Corp., Chicago, Ill.
Universal Controls Corp., Dallas, Tex.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

TESTERS, MOISTURE

Brabender Corp., Rochelle Park, N. J. (semi-automatic)
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Hill & Co., E. Vernon, Lake Geneva, Wis.

TESTERS, SMOKE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Gelman Instrument Co., Chelsea, Mich.
Kilgore, Inc., International Flare-Signal Div., Westerville, O.
McNeill Smoke Eliminator Co., Chicago, Ill.
Research Appliance Co., Allison Park, Pa.

TESTERS, SOUND, FOR LOCATING MECHANICAL TROUBLES

Airserco Mfg. Co., Pittsburgh, Pa.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Scott, Inc., H. H., [illegible] Div., Maynard, Mass.

THAWERS, PIPE, ELECTRIC, PORTABLE

Fern, Ralph, Scranton, Pa.
Hammett Electric Co., Kansas City, Kans.
Harold Electric Co., Walla Walla, Wash.
Hobart Bros. Co., Troy O.
Trindl Products, Ltd., Chicago, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOMETER WELLS

See Wells, Thermometer

THERMOMETERS, INDICATING, INDUSTRIAL

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif.
Electric Autolite Co., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Evanston, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Moeller Instrument Co., Richmond Hill, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Pacific Transducer Corp., Los Angeles, Calif. (for surface temperatures)
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Partlow Corp., The, New Hartford, N. Y.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Royco Instruments, Mountain View, Calif.
Sarco Co., Inc., New York, N. Y.
Schaevitz Engineering, Camden, N. J.
Scientific Instrument Co., Detroit, Mich.
Simpson Electric Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United Instrument Co., Brooklyn, N. Y.
United States Gauge Div. of America Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weiss & Son, Inc., Albert A., Brooklyn, N. Y.
Weksler Instruments Corp., Freeport, L. I., N. Y.
West Instrument Corp., Chicago, Ill.
Yellow Springs Instrument Co., Inc., Yellow Springs, O.

THERMOMETERS, INDICATING, PIPE SURFACE TEMPERATURE

Airserco Mfg. Co., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Moeller Instrument Co., Richmond Hill, N. Y.
Pacific Transducer Corp., Los Angeles, Calif.
Palmer Thermometers, Inc., Cincinnati, O.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Royco Instruments, Mountain View, Calif.
Simpson Electric Co., Chicago, Ill.
Trerice Co., H. O., Detroit, Mich.
Victory Engineering Corp., Union, N. J.
West Instrument Corp., Chicago, Ill.
Yellow Springs Instrument Co., Inc., Yellow Springs, O.

THERMOMETERS, INDICATING, REMOTE-READING

Airguide Instrument Co., Chicago, Ill.
Assembly Products, Inc., Chesterland, O.
Atkins Technical, Inc., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Century Instrument Co., Detroit, Mich.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N.J.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
Electric Autolite Co., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garden City Instruments, Inc., Evanston, Ill.
General Controls Co., Glendale, Calif.
Giannini & Co., Inc., G. M., Pasadena, Calif.
H-B Instrument Co., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Industrial Development Laboratories, Inc., Edgewater, N. J.
Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Royco Instruments, Mountain View, Calif.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Simpson Electric Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Thompson Research & Mfg. Co., Davenport, Fla.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.
West Instrument Corp., Chicago, Ill.
Yellow Springs Instrument Co., Inc., Yellow Springs, O.

THERMOMETERS, INDICATING, WALL

Airguide Instrument Co., Chicago, Ill.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Autolite Co., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Evanston, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weksler Instruments Corp., Freeport, L. I., N. Y.
West Instrument Corp., Chicago, Ill.

THERMOMETERS, KATA

Hill & Co., E. Vernon, Lake Geneva, Wis.

THERMOSTATIC BELLOWS

See Bellows, Thermostatic and Metallic

THERMOSTATIC BI-METALS

See Bi-Metals, Thermostatic

THERMOSTATIC TRAPS

See Traps, Steam, Thermostatic

THERMOSTAT GUARDS

See Guards, Thermostat, to Prevent Tampering

THERMOSTATS, DUCT TYPE

American District Telegraph Co., New York.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Stevens Mfg. Co., Inc., Mansfield, O.
Therm-O-Disc, Inc., Mansfield, O.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco.

White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, EFFECTIVE TEMPERATURE

Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Johnson Service Co., Milwaukee, Wis.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, IMMERSION

American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Deutsch Controls Corp., Los Angeles, Calif.
Fenwal Inc., Ashland, Mass.
General Electric Co., Shelbyville, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Shelbyville, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hart Mfg. Co., Hartford, Conn.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco, Calif.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, RADIANT HEAT

American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Berko Electric Mfg. Co., Queens Village, N. Y.
Ceilheat, Inc., Knoxville, Tenn.
Everwarm, Inc., Knoxville, Tenn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
General Electric Co., Wiring Device Dept., Providence, R. I.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Roberson, Inc., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico Controls Inc., Delanco, N. J.
Sunwarm, Inc., Kingsport, Tenn.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, ROOM OR WALL

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Baso, Inc., Milwaukee, Wis.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Crown Controls Co., Inc., New Bremen, O.
Electronics Corp. of America, Cambridge, Mass.
Everwarm, Inc., Knoxville, Tenn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Appliance Control Dept., Morrison, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mears Electric Controls, Inc., Portland, Ore.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Controls, Inc., Newton, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Roberson Inc., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Signet Controls, Portland, Ore.
Tennessee Plastics, Inc., Johnson City, Tenn.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.
Zell-Aire Corp., Reading, Pa.

THERMOSTATS, SURFACE

American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Cox & Co., Inc., New York, N. Y.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hart Mfg. Co., Hartford, Conn.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
Mears Electric Controls, Inc., Portland, Ore.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Red Spot Electric Co., Tacoma, Wash.
Roberson Inc., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Stevens Mfg. Co., Inc., Mansfield, O.
Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
Therm-O-Disc, Inc., Mansfield, O.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, TWO STAGE, FOR COOLING

Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill. (multi-stage, 2 to 10 stage)
Barber-Colman Co., Rockford, Ill.
General Controls Co., Glendale, Calif.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Ranco Incorporated, Columbus, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.

THERMOSTATS, TWO STAGE, FOR HEATING

Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill. (multi-stage, 2 to 10 stage)
Barber-Colman Co., Rockford, Ill.
General Controls Co., Glendale, Calif.
Mears Electric Controls, Inc., Portland, Ore.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ranco Incorporated, Columbus, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, TWO TEMPERATURE OR DUAL

American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Fenwal Inc., Ashland, Mass.
Franklin Dales Co., Akron, O.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Ranco Incorporated, Columbus, O.
Roberson Inc., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, WEATHER COMPENSATING

Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Clark-Cooper Co., Inc., CC Pump Div., Palmyra, N. J.
Crown Controls Co., Inc., New Bremen, O.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Appliance Control Dept., Morrison, Ill.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
White-Rodgers Co., St. Louis, Mo. (Level-Temp)

THREADERS, PIPE

See Stocks and Dies

TIME RECORDER-TOTALIZERS

See Recorder-Totalizers, Time

TIME SWITCHES

See Switches, Time

TONGS, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

TOOLS (CHISELS, PLIERS, ETC.)

Adre Co., The, Hales Corners, Wis. (burnishers for electrical contacts)
Allan Distributors, Long Island City, N. Y. (liquid tool for loosening rusted parts)
Allison-Campbell Div. of American Chain & Cable Co., Inc., Bridgeport, Conn. (abrasive cut-off machines)
Ampco Metal, Inc., Milwaukee, Wis.
Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind. (hack saws, hand saws, plumb-

er's saws, files)
Badger Sales Co., Inc., Los Angeles, Calif. (magnifying inspectoscope for inspection of hard-to-get-at places)
Basford Co., H. R., San Francisco, Calif. (pliers)
Bestt Rollr Co., Fond du Lac, Wis. (applicator for painting pipe lines)
Billings & Spencer Co., Hartford, Conn.
Birks Mfg. Co., Meriden, Conn. (Pittsburgh lock seam opener)
Black & Decker Mfg. Co., The, Towson, Md. (electric screw driver)
Bonney Forge & Tool Works, Allentown, Pa.
Boston Machine Works Co., Lynn, Mass. (nozzle extractor)
Bostitch, East Greenwich, R. I. (staplers and stitchers)
Brown-Brockmeyer Co., Inc., Dayton, O. (tool grinders)
Buckeye Tools Corp., Dayton, O. (Portable air wrenches and sheet metal nibblers)
Caliputer, Rancho Sante Fe, Calif. (Caliper-scale)
Cam-Lok Div., Empire Products, Inc., Cincinnati, O. (electrode holders)
Carlson Rules Works, Disston Div., H. K. Porter Co. (Delaware)
Champion-DeArment Tool Co., Meadville, Pa. (pliers, hammers)
Collins Machinery Corp., Los Angeles, Calif.
Crescent Tool Co., Jamestown, N. Y.
Demo-Haines Tool Corp., Machine Works, El Segundo, Calif. (portable rotary hammer & drills)
Diamond Tool & Horseshoe Co., Duluth, Minn. (wrenches)
Dreier Brothers, Inc., Chicago, Ill. (level for determining pitch of pipe; hack saws)
Duro-Dyne Corp., Farmingdale, L. I., N. Y. (file handles and solder iron handles, punches)
Duro Metal Products Co., Chicago, Ill.
Engesser & Co., William L., El Monte, Calif. (bull bits, angle drill attachment)
Erie Tool Wks., Erie, Pa. (Vises, cutter wheels, rollers)
Fairmount Tool & Forging, Inc., Cleveland.
Fastening Devices, Inc., Brooklyn, N. Y. (stud driver)
Fastway Fasteners, Inc., Lorain, O. (for hanging duct straps, heating units, etc. on masonry walls)
Frankell Mfg. Co., Jersey City, N. J. (hermetic compressor opener)
Franklin Balmar Corp., Baltimore, Md. (disc grinders)
Gel-Me Co., Bloomington, Ill. (electric sound probe for locating mechanical trouble)
Greene, Tweed & Co., North Wales, Pa.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hamer-Dril Co., New York, N.Y. (attachment for electric drill to make power hammer)
Hexdall Co., A. M., Morris, Ill. (Pittsburgh lock hammers, tee hammers, seam openers)
Hilti Rapid Fastening Systems, Inc., Stamford, Conn. (hammer and power assisted drive tools)
Howes-Wood Co., Cambridge, Mass. (hacksaws, blades, handsaws)
Hydrozion Engineering Co., Inc., Kansas City, Mo. (earth boring auger)
Independent Blade Corp., Joliet, Ill. (plastic cutting & other saw blades)
Instrument Cases, Div. of TA Mfg. Corp., Los Angeles, Calif. (instrument cases)
Jaco Devices Co., Hingham, Mass. (drill attachment for sawing, etc.)
Kass Hardware & Supply Co., Inc., Bronx, N. Y. (drills for sheet metal)
Kent-Moore Organization, Inc., Warren, Mich.
Key-Hak Div., Producers & Distributors, Inc., Allentown, Pa. (hack saw blades for portable power hack saw)
Lenco, Inc., Jackson, Mo. (electrode holders)
Lenk Mfg. Co., Franklin, Ky. (electric soldering irons)
Levow, Inc., David, South Hackensack, N. J.
Lufkin Rule Co., Saginaw, Mich. (steel tapes and folding rules)
Matrix Engineering Corp., Minneapolis, Minn. (pneumatically operated nail driver for concrete, wood, sheet metal)
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis. (electric screw drivers and hack saws)
Misener Mfg. Co., Inc., Syracuse, N. Y. (hole saws)
Nielsen, Inc., E. V., Stamford, Conn.
Nupla Mfg. Co., Los Angeles, Calif. (hammers of all types)
Omega Products, Chicago, Ill. (pocket size voltage tester)
Owens Co., H., Culver City, Calif. (pattern developer tool for sheet metal work)
Petersen Mfg. Co., DeWitt, Nebr. (clamps)
Phillips Drill Co., Michigan City, Ind. (impact hammers)
Phillips Impact Swedging Tool Co., North Miami, Fla. (impact tools)
Pickett & Eckel, Inc., Alhambra, Calif. (slide rule)
Pioneer Tool Co., Racine, Wis. (scratch awls, crimping pliers, saw handles)
Port City Machine & Tool Co., Muskegon, Mich. (for closing Pittsburgh Lock)
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
R C S Tool Corp., Bloomington, Ill. (reciprocating saw attachment; right angle drill attachments)
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn. (Powder-actuated tools, hammer)
Rawlplug Co., Inc., The, New Rochelle, N. Y. (drills for masonry)
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Reiner & Campbell Co., Inc., Newark, N. J. (Dividers, drive cleat notchers; clip punch; swivel head squeezer tong)
Remington Arms Co., Inc., Bridgeport, Conn. (powder-actuated tools)
Richmont, Inc., Monrovia, Calif.
Rotary Concrete Drill Co., Pasadena, Calif. (Drill bits)
Rotor Tool Co., Cleveland, O.
Salsbury Corp., Los Angeles, Calif. (air hammer)
Scharf Mfg. Co., J. H., Omaha, Nebr. (magnesium levels)
Schild Mfg. Co., Beaver Dam, Wis.
Skinner Co., M. B., South Bend, Ind. (pipe drilling adapter)
Snap-on Tools Corp., Kenosha, Wis.
Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Superior Pneumatic & Mfg. Co., Inc., Cleveland, O. (air hammer)
Superior Valve & Fittings Co., Pittsburgh, Pa. (wrenches, valving, hand)
Thompson & Son Co., The Henry G., New Haven, Conn.
Truco Masonry Drilling Div., Wheel Trueing Tool Co., Detroit, Mich. (concrete drills)
Union Steel Chest Corp., LeRoy, N. J. (tool chests)
Walton Co., Hartford, Conn. (pipe and stud extractors)
Wassco Electric Products Corp., St. Petersburg, Fla. (soldering pliers for copper tubing)
Watervilet Tool Co., Inc., Albany, N. Y. (air hammer, pneumatic sander)
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill. (hammers, electric; groovers, plaster)
Yeats Appliance Dolly Sales Co., Milwaukee, Wis. (dolly for moving equipment upstairs)
Zimmerman Packing, Cincinnati, O. (Gasket cutter)

TOOLS, FLARING, FOR TUBING

Anderson Metals Corp., Kansas City, Mo.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Pneumatic Tool Co., New York.
Chicago Specialty Mfg. Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Engesser & Co., William L., El Monte, Calif.
Erie Tool Works, Erie, Pa.
Fairmount Tool & Forging, Inc., Cleveland.
Fine Products Co., Berwyn, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Warren, Mich.
Madden Brass Products Co., Aurora, Ill.
Miller Mfg. Co., St. Paul, Minn.
Mueller Brass Co., Port Huron, Mich.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Research Vacuum Supply Co., Chicago, Ill. (Press gears)
Sac Tool Mfg. Co., St. Louis, Mo.
Schaul Mfg. Co., Cleveland, Ohio
Snap-On Tools Corp., Kenosha, Wis.
Spanco Brass Sales, Allegan, Mich.
Talon Tools, Inc., North Arlington, N. J.
Wiedeke Co., The Gustav, Dayton, O.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.
Wilson, Inc., Thomas C., Long Island City.
Wilson Manufacturing Co., Memphis, Tenn.

TORCHES, BRAZING SOLDERING AND WELDING

Aeroil Products Co., Inc., South Hackensack, N. J.
Aeroprojects, Inc., West Chester, Pa.
Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Atlas Welding Accessories, Inc., Ferndale, Mich.
Bernz Co., Otto, Rochester, N. Y.
Borm Mfg. Co., Elgin, Ill.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Dockson Corp., Detroit, Mich.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Fushing, N. Y.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Goss Gas, Inc., Glenshaw, Pa.
Harris Calorific Co., The, Cleveland, O.
Ideal Industries, Inc., Sycamore, Ill.
Insto-Gas Corp., Detroit, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
K-G Equipment Co., Allentown, Pa.
Lincoln Electric Co., The, Cleveland, O.
Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mid-States Welder Mfg. Co., Chicago, Ill.
Minn-Kota Foundry & Mfg. Co., Moorhead, Minn.
Modern Engineering Co., St. Louis, Mo.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Prepo Corp., Edgerton, Wis.
Ransome Torch & Burner Co., Emeryville, Calif.
Reiner & Campbell Co., Inc., Newark, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Sac Tool Mfg. Co., St. Louis, Mo.
Seelye Craftsmen, Inc., Minneapolis, Minn.
Selas Corp of America, Dresher, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Welding Equipment Corp., Minneapolis.
Torit Mfg. Co., St. Paul, Minn.
Trindl Products, Ltd., Chicago, Ill.
Turner Corp., Sycamore, Ill.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich. (for L-P gas, also oxy-acetylene)

TOWERS, COOLING, ATMOSPHERIC DRAFT

American Cooling Tower Co., Kansas City, Mo.
Binks Mfg. Co., Chicago, Ill.
Fluor Products Co., Santa Rosa, Calif.
Koch Engineering Co., Inc., Wichita, Kans.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Mason Products, Inc., Woburn, Mass.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Phillips Cooling Tower Co., Inc., Brooklyn.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Stewart Ice Machine Co., Pomona, Calif.
Thermal Agency, Houston, Tex.
TOT Towers Co., Houston, Tex.
Toungate & Coats, Austin, Tex. (reinforced plastic)
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.

TOWERS, COOLING, MECHANICAL DRAFT

Acme Industries, Inc., Jackson, Mich.

Air Purification Service, Inc., New York, N. Y.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Coils Co., Farmingdale, N. J.
American Cooling Tower Co., Kansas City, Mo.
Arkla Air Conditioning Corp., Little Rock, Ark.
Baldwin Ward Mfg. Co., Inc., Ottawa, Ks.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Binks Mfg. Co., Chicago, Ill.
Blazer & Son, M., Passaic, N.J.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Deansteel Products Co., San Antonio, Tex.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fluor Products Co., Santa Rosa, Calif.
Foster Wheeler Corp., New York, N. Y.
Goodfellow Co., Inc., E. D., Memphis, Tenn.
Governair Corp., Oklahoma City, Okla.
Halstead & Mitchell, Pittsburgh, Pa.
Havens Cooling Towers, Div. of Havens Structural Steel Co., Kansas City, Mo.
Hindle Transformer Co., Inc., Flemington, N. J.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Krueger Air Conditioning Co., Tucson, Ariz.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Larkin Coils, Inc., Atlanta, Ga.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Marlo Coil Co., St. Louis, Mo.
Mason Products, Inc., Woburn, Mass.
Master-Bilt Refrigeration Mfg. Co., St. Louis, Mo.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Morris Sheet Metal Works, Columbus, O.
Niagara Products Co., Phoenix, Ariz.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Reco Products Div., Recony Corp., New York, N. Y.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
S & C Mfg. Co., Cincinnati, O.
Schancke, Inc., Evansville, Ind.
Silvercraft, Inc., Louisville, Ky.
Smithco Engineering, Inc., Cooling Tower Div., Houston, Tex.
Sun-Fire Stoker Corp., New Albany, Ind.
Tedco Cooling Towers, Div. of Engineering & Development Co., Inc., St. Louis, Mo.
TOT Towers Co., Houston, Tex.
Toungate & Coats, Austin, Tex. (reinforced plastic)
Vogt Machine Co., Henry, Louisville, Ky. (packaged unit with condenser, pump, etc.)
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Wayne Coil & Tower Corp., Pompton Plains, N. J.

TOWERS, COOLING, NOISE ELIMINATION FOR

See Noise Elimination for Cooling Towers

TRANSFORMERS, BOOST AND BUCK

(for voltage control)

Acme Electric Corp., Cuba, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hindle Transformer Co., Inc., Flemington, N. J.

TRANSFORMERS, ELECTRIC

Acme Electric Corp., Cuba, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arjac Products Inc., Rochester, N. Y.
Central Transformer Corp., Pine Bluff, Ark.
Crown Controls Co., Inc., New Bremen, O.
Dormeyer Industries, Chicago, Ill.
Eisler Engineering Co., Inc., Newark, N.J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Co., Kansas City, Kans.
Jefferson Electric Co., Bellwood, Ill.
Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
National Controls, Inc., Newton, Mass.
Rex Welder Co., Benton Harbor, Mich.
Sangamo Electric Co., Springfield, Ill.
Schaevitz Engineering, Camden, N. J.
Sola Electric Co., Chicago, Ill. (voltage regulating)
Sperti Faraday, Inc., Adrian, Mich.
Taylor-Winfield Corp., Warren, O.
Thermador Electrical Mfg., Los Angeles.
Trindl Products, Ltd., Chicago, Ill.
Union Electric & Mfg. Co., Jersey City, N. J. (ignition)
Wagner Electric Corp., St. Louis, Mo.
Webster Electric Co., Racine, Wis. (oil burner)
Westinghouse Electric Corp., Pittsburgh, Pa.

TRANSMISSION DRIVES

See Drives, Chain, Flat Belt and V-Belt

TRANSMITTERS, FLOW

Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barton Instrument Corp., Monterey Park, Calif.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Moore Products Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.

TRANSMITTERS, PRESSURE AND TEMPERATURE

Automatic Control Co., St. Paul, Minn.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barton Instrument Corp., Monterey Park, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Giannini & Co., Inc., **G. M., Pasadena, Calif.**
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Div of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals Inc., Sellersville, Pa.

TRAPS, MAGNETIC, FOR REMOVING TRAMP IRON FROM PIPE LINES

Columbia Engineering Service Co., Santa Rosa, Calif.
Dings Magnetic Separator Co., Milwaukee.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Zurn Industries, Inc., Erie, Pa.

TRAPS, STEAM, FLOAT-THERMOSTATIC

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., **Newtonville, Mass.**
Cashin Co., W. D., Boston, Mass.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Regulator Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Haines Co., Inc., Wm. S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
L.R.P., Inc., Leicester, N. Y.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Owens & Co., Inc., Henry, Cranston, R. I.
Sarco Co., Inc., New York, N. Y.
Sellers Injector Corp., Philadelphia, Pa.
Squires Co., C. E., The, Cleveland, O.
Sterling Inc., Milwaukee, Wis.
Trane Co., LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.
Vis-A-Plug, Inc., King of Prussia, Pa.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

TRAPS, STEAM, LIFT

Clark Mfg. Co., Cleveland, O.
Morehead Moisture Control, Detroit, Mich.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Velan Valve Corp., Plattsburgh, N. Y.

TRAPS, STEAM, MECHANICAL

Acker Corp., Meridian, Miss.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Coe Mfg. Co., Painesville, O.
Crane Co., Chicago, Ill.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Haines Co., Inc., Wm. S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, **American Air** Filter Co., Inc., Louisville, Ky.
Kaye & MacDonald, Inc., West Orange, N. J.
L.R.P., Inc., Leicester, N. Y.
Leavitt Machine Co., Orange, Mass.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McAuley Trap Co., Pittsburgh, Pa.
Monash-Younker Co., Inc., Chicago, Ill.
Morehead Moisture Control, Detroit, Mich.
Nason Co., Clarkston, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Perfecting Service Co., Charlotte, N. C.
Sarco Co., Inc., **New York, N. Y.**
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Conneaut, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Vis-A-Plug, Inc., King of Prussia, Pa. (bucket only)
Watson & McDaniel Co., Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

TRAPS, STEAM, PUMPING

Clark Mfg. Co., Cleveland, O.
Johnson Corp., The, Three Rivers, Mich.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.

TRAPS, STEAM, RADIATOR

Dunham-Bush, Inc., West Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.
Webster & Co., Warren, Camden, N. J.

TRAPS, STEAM, THERMOSTATIC

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Haines Co., Inc., Wm. S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Powers Regulator Co., Skokie, Ill.
Riggio Co., Inc., Frank D., Rutherford, N. J.
Sarco Co., Inc., New York, N. Y.
Sellers Injector Corp., Philadelphia, Pa.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Strong, Carlisle & Hammond, Conneaut, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Velan Valve Corp., Plattsburgh, N. Y.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

TRAPS, WATER, FOR OIL TANKS

Clark Mfg. Co., Cleveland, O.
Squires Co., C. E., The, Cleveland, O.

TREATMENT, CHEMICAL, TO REMOVE SCALE

Acme Chemical Co., Milwaukee, Wis.
Allen Co., Robert G., Mechanicsville, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Berna Corp., Garwood, N. J.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Dearborn Chemical Co., Chicago, Ill.
Dowell Div. of The Dow Chemical Co., Tulsa, Okla.
Gotham Refining Chemical Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hall Laboratories, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lester Laboratories, Inc., Atlanta, Ga.
Normal Chemical Co., St. Paul, Minn.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Permutit Co., The, Div. of Pfaudler Permutit, Inc., New York, N. Y.
Perolin Co., Inc., The, New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Salsbury Corp., Los Angeles, Calif.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Stiles Karlsonite Corp., Waukegan, Ill.
X Laboratories, Inc., New York, N. Y.

TREATMENT, FUEL OIL, TO PREVENT SLUDGE

Acme Chemical Co., Milwaukee, Wis.
Allen Co., Robert G., Mechanicsville, N. Y.
American Sand-Banum Co., Inc., Merrick, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Eds-Wil Burner Corp., Chicago, Ill.
Evis Mfg. Co., Chicago, Ill.
Gotham Refining Chemical Co., New York, N. Y.
Hercules Chemical Co., Inc., New York, N. Y.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Monsanto Chemical Co., St. Louis, Mo.
Montgomery Chemical Co., Jenkintown, Pa.
Nalco Chemical Co., Chicago, Ill.
Normal Chemical Co., St. Paul, Minn.
North American Mogul Products Co., The, Cleveland, O.
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., New York, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Sudbury Laboratory, South Sudbury, Mass.
Warren Refining & Chemical Co., The, Cleveland, O.

TREATMENT, STEAM SYSTEM, TO INHIBIT CORROSION

Acme Chemical Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American K. A. T. Corp., Subsidiary of Magnus Chemical Co., Inc., Garwood, N. J.
American Water Softener Co., Philadelphia, Pa.
American Well Wks., Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Berna Corp., Garwood, N. J.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Cochrane Corp., Philadelphia, Pa.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Easton R. S. Corp., Brooklyn, N. Y.
Elgin Softener Corp., Elgin, Ill.
Gotham Refining Chemical Co., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hall Laboratories, Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Madison, N. J.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Nalco Chemical Co., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Packard Mfg. Co., Jacksonville, Fla.
Perolin Co., Inc., New York, N. Y.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Warren Refining & Chemical Co., Cleveland, O.
Water Treatment Co. of America, Pittsburgh, Pa.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO INHIBIT CORROSION

Acme Chemical Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Sand-Banum Co., Inc., Merrick, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
Barnstead Still & Fertilizer Co., Boston, Mass.
Berna Corp., Garwood, N. J.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Cepi-American, Inc., Hillside, Ill.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Easton R.S. Corp., Brooklyn, N. Y.
Electro Rust-Proofing Corp., Belleville, N. J.
Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Garman Co., Inc., The, St. Louis, Mo.
Gotham Refining Chemical Co., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hall Laboratories, Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Industrial Filter & Pump Co., Cicero, Ill.
Infilco, Inc., Tucson, Ariz.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Layne & Bowler, Inc., Memphis, Tenn.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Morheat Corp., Cincinnati, O.
Narda Ultrasonics Corp., Westbury, Long Island, N. Y.
Nalco Chemical Co., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Pacific Lumber Co., The, San Francisco, Calif.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Perolin Co., Inc., New York, N. Y.

Reynolds Water Conditioning Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Salsbury Corp., Los Angeles, Calif.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Uniflow Mfg. Co., Erie, Pa.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Virginia Smelting Co., West Norfolk, Va
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Company of America, Pittsburgh, Pa.
Wyandotte Chemicals Corp., Wyandotte, Mich.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO PREVENT SCALE FORMATION

Acme Chemical Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Sand-Banum Co., Inc., Merrick, N. Y.
American Water Softener Co., Philadelphia.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aqua Electric Scale Control, Inc., Cleveland, O.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Barnstead Still & Fertilizer Co., Boston, Mass.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Cepi-American, Inc., Hillside, Ill.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Easton R. S. Corp., Brooklyn, N. Y.
Elgin Softener Corp., Elgin, Ill.
Evis Mfg. Co., Chicago, Ill.
Garman Co., Inc., The, St. Louis, Mo.
Gotham Refining Chemical Co., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hall Laboratories, Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford. Ill.
Imperial Chemicals Corp., Los Angeles, Calif.
Infilco, Inc., Tucson, Ariz.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lester Laboratories, Inc., Atlanta, Ga.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Narda Ultrasonics Corp., Westbury, Long Island, N. Y.
Nalco Chemical Co., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Pacific Lumber Co., The, San Francisco, Calif.
Packard Water Conditioners, Inc., Jacksonville, Fla.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Perolin Co., Inc., The, New York, N. Y.
Reynolds Water Conditioning Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler-Filtrion Corp., North Chicago, Ill.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Uniflow Mfg. Co., Erie, Pa.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Virginia Smelting Co., West Norfolk, Va.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
Wyandotte Chemicals Corp., Wyandotte, Mich.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, FOR SLIME AND ALGAE CONTROL

Acme Chemical Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
Barnstead Still & Fertilizer Co., Boston, Mass.
Berna Corp., Garwood, N. J.
B-I-F Industries, Proportioneers Div., Providence, R. I.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
Builders Providence Div., B-I-F Industries, Inc., Providence, R. I.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Carolina Aniline & Extract Co., Charlotte, N. C.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dow Chemical Co., The, Midland, Mich.
Drew & Co., Inc., E. F., New York, N. Y.
Easton R. S. Corp., Brooklyn, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fischer & Porter Co., Hatboro, Pa.
Garman Co., Inc., The, St. Louis, Mo.
Gotham Refining Chemical Co., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hall Laboratories, Pittsburgh, Pa.
Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J. (ultraviolet)
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Imperial Chemicals Corp., Los Angeles, Calif.
Infilco, Inc., Tucson, Ariz.
Jeffrey Mfg. Co., Columbus, O.
Layne & Bowler, Inc., Memphis, Tenn.
Lester Laboratories, Inc., Atlanta, Ga.
Magnus Chemical Co., Garwood, N. J.
Metal & Thermit Corp., Rahway, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Nalco Chemical Co., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Norwood Associated Engineers, Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Pacific Lumber Co., The, San Francisco, Calif.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Pennsalt Chemicals Corp., Philadelphia, Pa.
Perolin Co., Inc., New York, N. Y.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Solvay Process Div., Allied Chemical Corp., New York, N. Y.
Sparkler-Filtrion Corp., North Chicago, Ill.
Steelcote Mfg. Co., St. Louis, Mo.
Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Stiles Karlsonite Corp., Waukegan, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Uniflow Mfg. Co., Erie, Pa.
Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Virginia Smelting Co., West Norfolk, Va.
Wallace & Tiernan, Inc., Belleville, N. J.
Water Refining Co., Middletown, O.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.

TRENCHING MACHINES FOR PIPE LINES

See Machines, Trenching for Pipe Lines

TRUCKS, LIFT

American Pulley Co., The, Philadelphia, Pa
Engine & Material Handling Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Thern Machine Co., Winona, Minn.

TRY-COCKS, BOILER

Crane Co., Chicago, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Lunkenheimer Co., Cincinnati, O.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

TUBE CLEANERS

See Cleaners, Tube

TUBE FINNING MACHINES

See Machines, Tube Finning

TUBES, BOILER

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)

TUBES, CONDENSER

American Brass Co., Waterbury, Conn.
Ampco Metal, Inc., Milwaukee, Wis.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Byers Co., A. M., Pittsburgh, Pa. (cold drawn wrought iron)
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Clayton Mark & Co., Evanston, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Edwards Engineering Corp., Pompton Plains, N. J.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Lewin-Mathes Co., Div. of Cerro de Pasco Corp., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass Inc., New York, N. Y.
Reynolds Metals Co., Richmond, Va.

Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Scovill Mfg Co., Waterbury, Conn. (copper base)
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.

TUBES, PITOT

Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Meriam Instrument Co., The, Cleveland, O.
Simplex Valve & Meter Co., Lancaster, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Sensor & Control Corp., Glastonbury, Conn.

TUBING, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Anaconda Aluminum Co., Louisville, Ky.
Bohn Aluminum & Brass Corp., Detroit, Mich.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Channel Master Corp., Ellenville, N. Y.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.
Penn Brass & Copper Co., Erie, Pa.
Revere Copper and Brass Inc., New York, N. Y.
Reynolds Metals Co., Richmond, Va.
Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Swepco Tube Corp., Clifton, N. J.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING BENDERS

See Benders, Tubing

TUBING, BRASS AND COPPER

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Hussey & Co., C. G., Div. of Copper Range Co., Pittsburgh, Pa.
Keeney Mfg. Co., Newington, Conn. (Chrome plated)
Kensico Tube Co., Mt. Kisco, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewin-Mathes Co., Div. of Cerro de Pasco Corp., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass Inc., New York, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (K-L-M and DWV)
United Wire & Supply Corp., Cranston, R. I.
Viking Copper Tube Co., Cleveland, O.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.
Young Regulator Co., Cleveland, O.

TUBING, BRONZE

American Brass Co., Waterbury, Conn.
Ampco Metal, Inc., Milwaukee, Wis.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
International Metal Hose Co., Bellevue, O.
Revere Copper and Brass Inc., New York, N. Y.

TUBING, CAPILLARY, FOR REFRIGERANTS

Allin Mfg. Co., Chicago, Ill.
American Brass Co., Waterbury, Conn.
Anaconda Metal Hose Div., American Brass Co., The, Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Kenisco Tube Co., Mt. Kisco, N. Y.
Madden Brass Products Co., Aurora, Ill.
Penn Brass & Copper Co., Erie, Pa.
Reading Tube Corp., New York, N. Y.
Refrigeration Research, Inc., Brighton, Mich.
Revere Copper and Brass Inc., New York, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
United Wire & Supply Corp., Cranston, R. I.
Wabash Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.

TUBING, CONTROL, FOR INSTRUMENTATION

Kensico Tube Co., Mt. Kisco, N. Y.
Moore & Co., Samuel, Mantua, O.
Nylon Molding Corp., Garwood, N. J.
Okonite Co., The, Passaic, N. J.

TUBING CUTTERS

See Cutters, Tubing

TUBING, DUPLEX

American Brass Co., Waterbury, Conn. (copper/steel admiralty/ steel)
Anaconda Metal Hose Div., American Brass Co., The, Waterbury, Conn. (metal)
Bridgeport Brass Co., Bridgeport, Conn. (combinations of Admiralty aluminum brass, copper, capro nickel, brass, aluminum, nickel, steel, stainless steel, alloy steel, tin)
Phelps Dodge Copper Products Corp., New York, N. Y. (copper alloy)
Polymer Corp., The, Reading, Pa. (nylon)
Republic Steel Corp., Cleveland, O. (Steel)
Uehling Instrument Co., Paterson, N. J.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Allen Park, Mich.

TUBING, FABRIC, FLEXIBLE

Arrowhead Products, Div. of Federal Mogul-Bower-Bearings, Inc., Long Beach, Calif.
Bemis Bro. Bag Co., St. Louis, Mo.
Flexible Tubing Corp., Guilford, Conn.
Johns-Manville, New York, N. Y.
Zippertubing Co., The, Los Angeles, Calif.

TUBING, FINNED

Also See Surface, Finned, Heating; and Surface, Finned, Cooling

TUBING, FINNED

Alco Products, Inc., Schenectady, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Brown Fintube Co., Elyria, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Coper Co., Waterbury, Conn. (spiral wound, copper)
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
F5 Air Conditioning Corp., Tulsa, Okla.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heat Transfer Products, Inc., Perkasie, Pa.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y. (internal fins)
Heatron, Inc., York, Pa.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lewis & Saunders, Inc., Lakeport, N. H.
McCord Corp., Detroit, Mich.
Merchant & Evans Co., Philadelphia, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Peerless of America, Inc., Chicago, Ill.
Reading Tube Corp., New York, N. Y.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rempe Co., Chicago, Ill.
Revere Copper & Brass, Inc., New York.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Schemenauer Mfg. Corp., Holland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
United Machinery Sales Co., Chicago, Ill.
United Wire & Supply Corp., Cranston, R. I.
Vapor Heating Corp., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Wall Tube & Metal Products Co., Newport, Tenn.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich (Aluminum, copper alloy)

TUBING, MAGNESIUM

Bridgeport Brass Co., Bridgeport, Conn.
Dow Chemical Co., The, Midland, Mich.

TUBING, METAL, FLEXIBLE

Allied Metal Hose Co., Long Island City, N. Y.
American Brass Co., Waterbury, Conn.
Anaconda Metal Hose Div., American Brass Co., The, Waterbury, Conn.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.
Atlantic Metal Hose Co., Inc., New York.
Bridgeport Brass Co., Bridgeport, Conn.
Cobra Metal Hose Div., D-K Mfg. Co., Chicago, Ill.
Crescent Insulated Wire & Cable Co., Trenton, N. J. (cabled)
Flexaust Co., New York, N. Y.
Flexonics Corp., Maywood, Ill.
International Metal Hose Co., Bellevue, O.
Keflex Mfg. Div. of U. S. Flexible Metallic Tubing Co., San Francisco, Calif.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia.
National Lead Co., New York, N. Y.
Packless Metal Hose, Inc., Mt. Vernon, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Titeflex, Inc., East Springfield, Mass.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.

TUBING, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Greenville Tubes, Inc., Greenville, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
International Nickel Co., Inc., The, New York, N. Y.
Lewin-Mathes Co., Div. of Cerro de Pasco Corp., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Revere Copper & Brass, Inc., New York.
Sawhill Tubular Products, Inc., Sharon, Pa.
Swepco Tube Corp., Clifton, N. J.
Titeflex, Inc., East Springfield, Mass.
Trent Tube Co., East Troy, Wis.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube Div. of Calumet and Hecla, Inc., Allen Park, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, NICKEL PLATED

Bart Mfg. Corp., Belleville, N. J.
Nikoh Tube Co., Chicago, Ill.

TUBING, PLASTIC

- Alpha Plastics, Inc., Livingston, N. J. (PVC)
- Amercoat Corp., South Gate, California. (rigid epoxy, 550 psi, @ 130 F)
- American Agile Corp., Bedford, O. (flexible)
- American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
- Anaconda Metal Hose Div., American Brass Co., The, Waterbury, Conn. (teflon)
- Anderson Metals Corp., Kansas City, Mo. (small sizes)
- Anesite Co., Chicago, Ill. (polyethylene, butyrate, kralastic, cycolac)
- Argo Plastic Products, Cleveland, O. (polyethylene, normal and linear, clear vinyl)
- Carlon Products Corp., Aurora, O.
- Chicago Gasket Co., Chicago, Ill.
- Commercial Plastics Co., Chicago, Ill. (rigid and non-rigid)
- Continental-Diamond Fibre Corp., Newark, Del.
- Crane Co., Chicago, Ill. (polyethylene)
- Crescent Insulated Wire & Cable Co., Trenton, N. J. (polyethylene)
- Crescent Plastics, Inc., Evansville, Ind. (flexible)
- Danielson Mfg. Co., Danielson, Conn. (nylon)
- Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y. (polyvinyl)
- Dow Chemical Co., The, Midland, Mich. (saran)
- Extruded Plastics, Inc., Norwalk, Conn.
- Fibercast Co., Sand Spring, Okla.
- Flexible Tubing Corp., Guilford, Conn.
- Flexonics Corp., Maywood, Ill. (teflon)
- Flexrock Co., Philadelphia, Pa. (teflon)
- Garlock Packing Co., Palmyra, N. Y. (teflon, nylon)
- Gates Rubber Co., The, Denver, Colo.
- General Electric Co., Laminated Products Dept., Coshocton, O. (laminated)
- Goodrich Industrial Products Co., B. F., Akron, O. (flexible and rigid)
- Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O. (PVC; flexible)
- Goodyear Tire & Rubber Co., Akron, O.
- Hamilton Rubber Mfg. Corp., Trenton, N. J.
- Haveg Industries, Inc., Wilmington, Del. (teflon)
- Hudson Industries, Inc., Detroit, Mich.
- Imperial Brass Mfg. Co., Chicago, Ill. (polyethylene and nylon)
- Industrial Plastic Fabricators, Norwood, Mass. (PVC)
- Irvington Div., Minnesota Mining & Mfg. Co., Irvington, N. J.
- Jaco Mfg. Co., Cleveland, O.
- Jarrow Products, Inc., Chicago, Ill. (vinyl plastic)
- LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rigid, PVC)
- Luzerne Rubber Co., Trenton, N. J. (rigid PVC)
- Manufacturers Corp., Mansfield, O.
- Moore & Co., Samuel, Mantua, O. (polyethylene)
- Mueller Brass Co., Port Huron, Mich. (polyethylene and PVC)
- Munray Products Div. of Fanner Mfg. Co., Cleveland, O. (polyethylene, vinyl)
- National Tube Div., United States Steel Corp., Pittsburgh, Pa. (polyethylene flexible polyvinyl chloride rigid)
- Nylon Molding Corp., Garwood, N. J. (nylon)
- Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif. (fibre and bakelite and sponge rubber)
- Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O. (polyethylene and nylon)
- Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif. (butyrate; polyethylene; acrylic; PVC; rigid; flexible PVC; cycolac; kralastic; nylon; styrene)
- Polygon Plastic Co., Walkerton, Ind.
- Polymer Corp., The, Reading, Pa. (Nylon)
- Pyramid Plastics, Inc., Chicago, Ill. (saran, polyethylene, vinyl)
- Quick Plastics, Jackson, Mich.
- Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
- Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O. (Vinyl)
- Resistoflex Corp., Roseland, N. J.
- Ryerson & Son, Inc., Joseph T., Chicago, Ill. (PVC)
- Sandee Mfg. Co. Chicago, Ill. (all thermoplastic)
- Saran Lined Pipe Co., Ferndale, Mich. (saran)
- Skyline Industries Sales, Inc., Titusville, Pa. (polyethylene)
- Southern Plastics Co., Columbia, S. C. (rigid, non-rigid)
- Southwestern Plastic Pipe Co., Mineral Wells, Tex. (polyethylene)
- Titeflex, Inc., East Springfield, Mass. (Teflon)
- Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible polyethylene, semi-rigid, rigid high impact)
- Uehling Instrument Co., Paterson, N. J.
- United States Gasket Co., Camden, N. J. (nylon, teflon)
- United States Rubber Co., New York, N. Y. (extruded)
- United States Stoneware Co., New York.
- United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
- Vanton Pump & Equipment Corp., Hillside, N. J. (vinyl-Polethylene)
- Western Plastics Corp., Tacoma, Wash. (polyethylene)
- Yardley Plastics Co., Columbus, O. (polyethylene, black and natural)
- Youngstown Sheet & Tube Co., Youngstown, O. (rigid)

TUBING, RUBBER

- Continental Rubber Wks., Erie, Pa.
- Garlock Packing Co., Palmyra, N. Y.
- Gates Rubber Co., The, Denver, Colo.
- General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
- Goodrich Industrial Products Co., B. F., Akron, O.
- Goodyear Tire & Rubber Co., Akron, O.
- Hamilton Rubber Mfg. Corp., Trenton, N. J.
- Hewitt-Robins, Inc., Stamford, Conn.
- Jarrow Products, Inc., Chicago, Ill. (sponge)
- LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
- Luzerne Rubber Co., Trenton, N. J. (hard rubber)
- Mercer Rubber Co., Hamilton Sq., N. J.
- Nazar Rubber Co., Toledo, O.
- Raybestos-Manhattan, Inc., Passaic, N. J.
- Rubatex Div., Great American Industries, Inc., Bedford, Va.
- United States Rubber Co., New York, N. Y. (extruded)

TUBING, SILVER CLAD AND SILVER ALLOY

- American Platinum & Silver Div., Engelhard Industries, Inc., Newark, N. J.
- General Plate Div., Metals & Controls Corp., Attleboro, Mass.
- Handy & Harman, New York, N. Y.
- Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.

TUBING, STEEL, ALLOY, SEAMLESS

- Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Electric Steel Foundry Co., Portland, Ore.
- Greenville Tubes, Inc., Greenville, Pa.
- Harrison Steel Corp., Brooklyn, N. Y.
- National Tube Div., United States Steel Corp., Pittsburgh, Pa.
- Pacific Tube Co., Los Angeles, Calif.
- Pittsburgh Steel Co., Pittsburgh, Pa.
- Republic Steel Corp., Cleveland, O.
- Ryerson & Son, Inc., Joseph T., Chicago, Ill.
- Sawhill Tubular Products, Inc., Sharon, Pa.
- Timken Roller Bearing Co., Canton, O.
- Tubular Div., The National Supply Co., Pittsburgh, Pa.
- Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
- Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, ALLOY, WELDED

- Carpenter Steel Co., Alloy Tube Div., Union, N. J.
- Crucible Steel Co. of America, Pittsburgh, Pa.
- Damascus Tube Co., Greenville, Pa.
- Greenville Tubes, Inc., Greenville, Pa.
- Harrison Steel Corp., Brooklyn, N. Y.
- National Tube Div., United States Steel Corp., Pittsburgh, Pa.
- Republic Steel Corp., Cleveland, O.
- Revere Copper & Brass, Inc., New York, N. Y.
- Ryerson & Son, Inc., Joseph T., Chicago, Ill.
- Sawhill Tubular Products, Inc., Sharon, Pa.
- Swepco Tube Corp., Clifton, N. J.
- Trent Tube Co., East Troy, Wis.
- Youngstown Sheet & Tube Co., Youngstown, O.
- Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, STEEL, BRAZED

- Avon Tube Div., Higbie Mfg. Co., Rochester, Mich.
- Bundy Tubing Co., Detroit, Mich.
- Sawhill Tubular Products, Inc., Sharon, Pa.

TUBING, STEEL, SEAMLESS

- Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Central Steel & Wire Co., Chicago, Ill.
- Electric Steel Foundry Co., Portland, Ore.
- General Plate Div., Metals & Controls Corp., Attleboro, Mass.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Lenz Co., Dayton, O.
- National Tube Div., United States Steel Corp., Pittsburgh, Pa.
- Pacific Tube Co., Los Angeles, Calif.
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Pittsburgh Steel Co., Phoenix Steel Tube Div., Pittsburgh, Pa.
- Republic Steel Corp., Cleveland, O.
- Ryerson & Son, Inc., Joseph T., Chicago, Ill.
- Sawhill Tubular Products, Inc., Sharon, Pa.
- Timken Roller Bearing Co., Canton, O.
- Tubular Div., The National Supply Co., Pittsburgh, Pa.
- Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, STAINLESS

- Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
- American Cast Iron Pipe Co., Birmingham, Ala.
- Autoclave Engineers Sales Corp., Erie, Pa.
- Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
- Carpenter Steel Co., Alloy Tube Div., Union, N. J.
- Central Steel & Wire Co., Chicago, Ill.
- Chase Brass & Copper Co., Waterbury, Conn.
- Crucible Steel Co. of America, Pittsburgh, Pa.
- Damascus Tube Co., Greenville, Pa.
- Electric Steel Foundry Co., Portland, Ore.
- Flexonics Corp., Maywood, Ill.
- Greenville Tubes, Inc., Greenville, Pa.
- Harrison Steel Corp., Brooklyn, N. Y.
- International Metal Hose Co., Bellevue, O.
- Ladish Co., Cudahy, Wis.
- National Tube Div., United States Steel Corp., Pittsburgh, Pa.
- Pacific Tube Co., Los Angeles, Calif.
- Posen & Kline Tube Co., Norristown, Pa.
- Republic Steel Corp., Cleveland, O.
- Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla.
- Ryerson & Son, Inc., Joseph T., Chicago, Ill.
- Sawhill Tubular Products, Inc., Sharon, Pa.
- Standard Tube Co., Detroit, Mich.
- Swepco Tube Corp., Clifton, N. J.
- Timken Roller Bearing Co., Canton, O.
- Trent Tube Co., East Troy, Wis.
- Union Steel Corp., Union, N. J.
- Wall Tube & Metal Products Co., Newport, Tenn.
- Youngstown Welding & Engrg. Co., Youngstown, O.

TUBING, STEEL, WELDED

- American Pipe & Steel Corp., Alhambra, Calif.
- Armco Steel Corp., Middletown, O.
- Avon Tube Div., Highbie Mfg. Co., Rochester, Mich.
- Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
- Bundy Tubing Co., Detroit, Mich. (solder coated)
- Central Steel & Wire Co., Chicago, Ill.
- Channel Master Corp., Ellenville, N. Y.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Clayton Mark & Co., Evanston, Ill.
- Crucible Steel Co. of America, Pittsburgh, Pa.
- Damascus Tube Co., Greenville, Pa.

H-P Products, Inc., Louisville, O.
Jones & Laughlin Steel Corp., Pittsburgh, Pa. (continuous electric weld)
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Nikoh Tube Co., Chicago, Ill.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Tube Co., Pittsburgh, Pa.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass, Inc., New York, N. Y.
Roll-Weld Pipe & Tube, Inc., Jacksonville, Fla.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
South Chester Tube Co., Philadelphia, Pa.
Standard Tube Co., Detroit, Mich.
Swepco Tube Corp., Clifton, N. J.
Trent Tube Co., East Troy, Wis.
Tubular Div., The National Supply Co., Pittsburgh, Pa.
Wheatland Tube Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, TITANIUM

Bridgeport Brass Co., Bridgeport, Conn.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Harrison Steel Corp., Brooklyn, N. Y.
Harvey Aluminum, Torrance, Calif.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Swepco Tube Corp., Clifton, N. J.
Trent Tube Co., East Troy, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, WROUGHT IRON

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Byers Co., A. M., Pittsburgh, Pa. (cold drawn)

TUBING, ZIRCONIUM

Babcock & Wilcox Co., The, Tubular Products Div., Beaver Falls, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Harvey Aluminum, Torrance, Calif.
Sawhill Tubular Products, Inc., Sharon, Pa.
Trent Tube Co., East Troy, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Allen Park, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TURBINES, MECHANICAL DRIVE

Carling Turbine Blower Co., Worcester, Mass.
Coppus Engineering Corp., Worcester, Mass.
Dean Hill Pump Co., Indianapolis, Ind.
Elliott Co., Jeannette, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Small Steam Turbine Dept., Fitchburg, Mass.
Murray Iron Wks. Co., Burlington, Ia.
Pyle-National Co., The, Chicago, Ill.
Solar Aircraft Co., San Diego, Calif.
Steam Turbine Div., Worthington Corp., Wellsville, N. J.
Terry Steam Turbine Co., Hartford, Conn.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiton Machine Co., New London, Conn.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Worthington Corp., East Orange, N. J.

2, 3 AND 4-WAY VALVES

See Valves, 2, 3 and 4-way

ULTRASONIC DUST AND FUME COLLECTION

See Collection, Dust and Fume, Ultrasonic

ULTRASONIC TESTING

See Equipment, Ultrasonic Testing

ULTRAVIOLET LAMPS

See Lamps, Sterilizing for Duct Installation; Units, Sterilizing, Air

UNDERGROUND PIPING

See Conduit, Underground Piping

UNDERWATER HEATERS

See Heaters, Steam Jet, for Liquids

UNIONS, BRASS

Acheson Mfg. Co., Rankin, Pa.
Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Airaterra (Roylyn Products), Glendale, Calif.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Ken-Ray Brass Products, Inc., Vermont, Ill.
King Union Co., Inc., Hillsgrove, R. I.
Leavitt Machine Co., Orange, Mass.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N. Y.
Nibco, Inc., Elkhart, Ind.
Patrol Valve Co., The, Cleveland, O. (dielectric insulating)
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.
Spanco Brass Sales, Allegan, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

UNIONS, INSULATING

See Joints, Pipe, Electrical Insulating

UNIONS, MALLEABLE, BRASS SEAT

Airaterra (Roylyn Products), Glendale, Calif.
Almar Hydraulic Valve Co., Cleveland, O.
Beaton & Corbin Mfg. Co., Southington, Conn.
Corley Co., Inc., The, Bounton, N. J.
Crane Co., Chicago, Ill.
Das Div. of The Zeller Corp., Defiance, O.
Fairbanks Co., The, New York, N. Y.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Jefferson Union Co., Lexington, Mass.
King Union Co., Inc., Hillsgrove, R. I.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Rockwood Sprinkler Co., Worcester, Mass.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburg, Pa.

UNIONS, ORIFICE

Catawissa Valve & Fittings Co., Catawissa, Pa.
Clayton Mark & Co., Evanston, Ill.
Conoflow Corp., Subsid. of Walworth Co., Philadelphia, Pa.
Dahl Co., Inc., G. W., Bristol, R. I.
Foxboro Co., Foxboro, Mass.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns Div. of Chemtron Corp., Louisville, Ky.
Walworth Co., New York, N. Y.

UNIONS, PLASTIC

Argo Plastic Products, Cleveland, O.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (unplasticized PVC)
Dow Chemical Co., The, Midland, Mich. (saran-lined)
Imperial Brass Mfg. Co., Chicago, Ill.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (PVC)
Luzerne Rubber Co., Trenton, N. J.
Skyline Industries Sales, Inc., Titusville, Pa.
Sloane Mfg. Co., Sun Valley, Calif.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (UPVC)
Vanton Pump & Equipment Corp., Hillside, N. J.

UNIONS, STEEL

Afco Fitting Co., Div. of Curtis Mfg. Co., Cleveland, O.
Anchor Coupling Co. Inc., Libertyville, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chiksan Co., Brea, Calif.
Clayton Mark & Co., Evanston, Ill.
Crane Co., Chicago, Ill.
Das Div. of The Zeller Corp., Defiance, O.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Gray Tool Co., Houston, Tex.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Ladish Co., Cudahy, Wis.
Patrol Valve Co., The, Cleveland, O. (dielectric insulating)
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Roselle, N. J.
Rockwood Sprinkler Co., Worcester, Mass.
Steel Improvement & Forge Co., The, Cleveland, O.
Tube Turns Div. of Chemetron Corp., Louisville, Ky.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

UNIT COOLERS

See Coolers, Unit

UNIT HEATERS

See Heaters, Unit

UNIT VENTILATORS

See Ventilators, Unit

UNITARY AIR CONDITIONERS, FOR AUTOMOBILES

A.R.A. Mfg. Co., Grand Prairie, Texas.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Frigidaire Div., General Motors Corp., Dayton, O.
Frigikar Corp., Dallas, Tex.
Great Northern Mfg. Corp., Chicago, Ill.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Keco Industries, Inc., Cincinnati, O.
Kool Engineering Corp., Chicago, Ill.
Kool-Kar Co., Inc., Detroit, Mich.
Mitchell Co., John E., Dallas, Tex.
Thermador Electrical Mfg., Los Angeles, Calif.

UNITARY AIR CONDITIONERS, BUS, TRUCK AND TRAILER

A.R.A. Mfg. Co., Grand Prairie, Texas.
Airflow Co., Rockville, Md.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Consumer Products, Motor Wheel Corp., Lansing, Mich.
Ellis & Watts Products Inc., Cincinnati, O.
Frigikar Corp., Dallas, Tex.

Keco Industries, Inc., Cincinnati, O.
McGraw-Edison Co., Clark Div. & Tropic-Aire Div., Chicago, Ill.
Metal Products Eng., Inc., Los Angeles, Calif. (Truck only)
Onan & Sons Inc., D. W., Minneapolis, Minn.
Thermo King Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Waukesha Motor Co., Waukesha, Wis.

UNITARY AIR CONDITIONERS, CENTRAL STATION TYPE

Self contained blower, heating and/or cooling coil, filter, humidifier unit for remote location and duct air distribution

Acme Industries, Inc., Jackson, Mich.
Air Conditioning, Inc., Ossining, N. Y. (5-30 tons)
Airfan Engineering Co., Los Angeles, Calif.
Airflow Co., Rockville, Md.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
Alton Mfg. Co., Dallas, Tex.
American Coils Co., Farmingdale, N. J.
American Cooling Tower Co., Kansas City, Mo.
American-Standard Industrial Div., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Anetsberger Bros., Inc., Div. of Union Electric Corp., Northbrook, Ill.
Arkla Air Conditioning Corp., Little Rock, Ark. (absorption type)
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Bryant Mfg. Co., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Domestic Mfg. Corp., Houston, Tex.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Ellis & Watts Products, Inc., Cincinnati, O
General Air Conditioning Corp., Los Angeles, Calif.
General Electric Co., Air Conditioning Dept., Tyler, Tex.
Gilbert & Barker Mfg. Co., West Spring, Mass.
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Howe Ice Machine Co., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
Master Fan Corp., Los Angeles, Calif.
McQuay, Inc., Minneapolis, Minn.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Midwest Air Conditioning Co., Des Moines, Ia.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Surface Combustion Corp., Toledo, O.
Temtrol, Inc., Okarche, Okla.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp **Corp., Brooklyn, N. Y.**
United States Air Conditioning Corp., Delaware, O. (10 to 60 tons)
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, EXCLUSIVELY FOR HOSPITAL OPERATING ROOMS, WITH EXPLOSIONPROOF MOTOR

Buffalo Forge Co., Buffalo, N. Y.
Chicago Steel Furnace Co., Chicago, Ill.
Conditioned Air, Inc., Charleston, W. Va.
Marlo Coil Co., St. Louis, Mo.
Niagara Blower Co., New York, N. Y.
Trane Co., The, La Crosse, Wis.
Worthington Corp., East Orange, N. J.

UNITARY AIR CONDITIONERS, HORIZONTAL PACKAGE TYPE

Self contained blower, cooling and/or heating coil, filter, humidifier unit for ceiling or platform location in space conditioned, for connection to remote compressor or cold water supply, and steam or hot water

Acme Industries, Inc., Jackson, Mich.
Addison Products Co., Addison, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Airfan Engineering Co., Los Angeles, Calif.
Airflow Co., Rockville, Md.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Coils Co., Farmingdale, N. J.
American-Standard Industrial Div., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Bal-Air Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Besser Furnace and Air Conditioning Corp., Charlotte, N. C.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Brown Products Corp., Union, N. J.
Bryant Mfg. Corp., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Buffalo, N. Y.
Friedrich Refrigerators, Inc., San Antonio, Tex.
General Electric Co., Air Conditioning Dept., Tyler, Tex. (ceiling mounted)
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
International Mfg. Co., Oklahoma City, Okla.
Iron Fireman Mfg. Co., Cleveland, O.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lennox Industries Inc., The, Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
Master Fan Corp., Los Angeles, Calif.
Mathes Co., The, Div. Glen Alden Corp., Ft. Worth, Tex.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Temtrol, Inc., Okarche, Okla.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Vilter Mfg. Co., Milwaukee, Wis.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Co., Cincinnati, O.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, INDUSTRIAL TYPE

Acme Industries, Inc., Jackson, Mich.
Airflow Co., Rockville, Md.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Cooling Tower Co., Kansas City, Mo.
American-Standard Industrial Div., Detroit, Mich.
Anetsberger Bros., Inc., Northbrook, Ill.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Cobell Industries, Inc., Cleburne, Tex.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dialatemp, Inc., St. Louis, Mo.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
F5 Air Conditioning Corp., Tulsa, Okla.
Frick Co., Waynesboro, Pa.
General Electric Co., Air Conditioning Dept., Tyler, Tex.
Governair Corp., Oklahoma City, Okla.
Haertel Co., Walter, Minneapolis, Minn.
Hastings Air Control, Inc., Omaha, Neb.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Howe Ice Machine Co., Chicago, Ill.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lintern Corp., Painesville, O.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
National-U.S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Franklin Park, Ill.
Rinehart Inc., Richmond, Ind.
Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Simplaire, New York, N. Y.
Surface Combustion Corp., Toledo, O.
Temtrol, Inc., Okarche, Okla.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Ventil-Aire Corp., Ridgewood, N. Y.

Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., East Orange, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, MOBILE, MOUNTED ON TRUCK OR TRAILER

Airflow Co., Rockville, Md.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (3 to 36 tons)
Ellis & Watts Products, Inc., Cincinnati, O.
Keco Industries, Inc., Cincinnati, O.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.

UNITARY AIR CONDITIONERS SUMMER, EVAPORATIVE COOLING TYPE

For cooling by evaporation, no dehumidification

Air-Cooling Engineering Co., Evanston, Ill.
Airfan Engineering Co., Los Angeles, Calif.
Air & Refrigeration Corp., New York, N. Y.
Alton Mfg. Co., Dallas, Tex.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Cleveland, N. C.
American-Standard Industrial Div., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Barwick Mfg. Corp., Wichita, Kan.
Buensod-Stacey, Inc., New York, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Carrier Corp., Syracuse, N. Y.
Comfort Products Inc., Dallas, Tex.
Dearborn Stove Co., Dallas, Tex.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Essick Mfg. Co., Los Angeles, Calif.
Farr Co., Los Angeles, Calif.
Gaffers & Sattler, Los Angeles, Calif.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
International Metal Products Co., Phoenix.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries, Inc., Marshalltown, Ia.
Magic Aire Div., United Electric Co., Wichita Falls, Tex.
Marlo Coil Co., St. Louis, Mo.
Martin Fan & Blower Co., Chicago, Ill.
Morey, Dan, Los Angeles, Calif. (as pen fiber replacement mats)
Mountain States Equipment Co., Denver.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
Palmer Mfg. Co., Phoenix, Ariz.
Parks-Cramer Co., Fitchburg, Mass.
R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.
Thermador Electrical Mfg., Los Angeles, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Wright Mfg. Co., Phoenix, Ariz.

UNITARY AIR CONDITIONERS, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 36,000 BTU PER HR CAPACITY

Self contained blower, coil, filter unit for connection to remote compressor or cold water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American-Standard Plumbing & Heating Div., New York, N. Y.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Union, N. J.
Carlen Associates, New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders Corp., Heating Div., Trenton, N. J.
Hastings Air Control, Inc., Omaha, Neb.
Hydrotherm, Inc., Northvale, N. J.
Ilg Electric Ventilating Co., Chicago, Ill.
International Mfg. Co., Oklahoma City, Okla.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Lennox Industries, Inc., Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Tenney Engineering, Inc., Union, N. J.
ThermoRay Corp., Newark, N. J.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Delaware, O.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitehall Engineering Co., Inc., Chicago, Ill.
Williamson Co., Cincinnati, O.
Worthington Corp., East Orange, N. J.
Wright Mfg. Co., Phoenix, Ariz.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, SUMMER, ROOM TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, UNDER 36,000 BTU PER HR CAPACITY

Self contained blower, coil, compressor, filter units

Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Furnace Co., St. Louis, Mo.
American-Standard Plumbing & Heating Div., New York, N. Y.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Cool-Ette, Inc., Detroit, Mich.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Emerson Radio & Phono Corp., Jersey City, N. J.
Fedders Corp., Buffalo, N. Y.
General Air Conditioning Corp., Los Angeles.
Great Northern Mfg. Corp., Chicago, Ill.
Hotpoint, Chicago, Ill.
Mathes Co., The, Div. Glen Alden Corp., Ft. Worth, Tex.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Philco Corp., Philadelphia, Pa.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rinehart Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Surface Combustion Corp., Toledo, O.
Sutton Corp., O. A., The, Wichita, Kan.
Viking Mfg. Corp., Cleveland, O.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Wright Mfg. Co., Phoenix, Ariz.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, SUMMER, STORE TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR CHILLED WATER, 36,000 BTU PER HR CAPACITY AND OVER

Self contained blower, coil, filter unit for connection to remote compressor or chilled water supply

Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Coleman Co., Inc., The, Wichita, Kans.
Governair Corp., Oklahoma City, Okla.
Lennox Industries, Inc., Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 36,000 BTU PER HR CAPACITY AND OVER

Self contained blower, coil, compressor, filter unit with air discharge approximately 6 ft above floor

Acme Industries, Inc., Jackson, Mich.
Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Coils Co., Farmingdale, N. J.
American Furnace Co., St. Louis, Mo.
American-Standard, Air Conditioning Div., New York, N. Y.
American-Standard Industrial Div., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Div. of National Union Electric Corp., Columbus, O.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Conditioned Air, Inc., Charleston, W. Va.
Cool-Ette, Inc., Detroit, Mich.
Crane Co., Chicago, Ill.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dialatemp, Inc., St. Louis, Mo.
Dunham-Bush, Inc., West Hartford, Conn.
Emerson Radio & Phono Corp., Jersey City, N. J.
Frick Co., Waynesboro, Pa.
Friedrich Refrigerators, Inc., San Antonio, Tex.
General Automatic Products Corp., Baltimore, Md.
General Electric Co., Air Conditioning Dept., Tyler, Tex.
Governair Corp., Oklahoma City, Okla.
Great Northern Mfg. Corp., Chicago, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Lennox Industries Inc., The, Marshalltown, Ia.
Mathes Co., The, Div. Glen Alden Corp., Ft. Worth, Tex.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Midwest Air Conditioning Co., Des Moines, Ia.
Mitchell Mfg. Co., Chicago, Ill.
Muncie Gear Wks., Inc., Muncie, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Philco Corp., Philadelphia, Pa.
Redmanson Corp., York, Pa.
Round Oak Co., Inc., Dowagiac, Mich.
Surface Combustion Corp., Toledo, O.
Therm-Air Mfg. Co., Peekskill, N. Y.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitehall Engineering Co., Inc., Chicago, Ill.
Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O.
Worthington Corp., East Orange, N. J.
Wright Mfg. Co., Phoenix, Ariz.

York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, WALL TYPE, SELF-CONTAINED, FOR MOUNTING THROUGH WALL ONLY

Addison Products Co., Addison, Mich.
American-Standard Air Conditioning Div., New York, N. Y.
American-Standard Plumbing & Heating Div., New York, N. Y.
Amic Mfg. Corp., Long Island City, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Coleman Co., Inc., The, Wichita, Kans.
Emerson Radio & Phono Corp., Jersey City, N. J.
Fedders Corp., Buffalo, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
I. W. Air Conditioning Corp., New York, N. Y.
Kelvinator Div., American Motors Corp., Detroit, Mich.
King Refrigerator Co., Glendale, N. Y.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Sutton Corp., O. A., The, Wichita, Kans.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Veco Products Co., Glenside, Pa.
Webster & Co., Warren, Camden, N. J.
Worthington Corp., East Orange, N. J.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, WINDOW, FOR CASEMENT WINDOWS

Admiral Corp., Chicago, Ill.
Amana Refrigeration, Inc., Amana, Ia.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Emerson Radio & Phono Corp., Jersey City, N. J.
Fedders Corp., Buffalo, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
I. W. Air Conditioning Corp., New York.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Philco Corp., Philadelphia, Pa. (Heating element available)
Sutton Corp., O. A., The, Wichita, Ks.
Westinghouse Electric Corp., Electric Appliance Divisions, Columbus, O.

UNITARY AIR CONDITIONERS, WINDOW, FOR DOUBLE-HUNG WINDOWS

Addison Products Co., Addison, Mich.
Admiral Corp., Chicago, Ill.
Amana Refrigeration, Inc., Amana, Ia.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Cauhorn Distributing Co., Detroit, Mich.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Coolerator Div., McGraw-Edison Co., Albion, Mich.
Emerson Electric Mfg. Co., The, St. Louis.
Emerson Radio & Phono Corp., Jersey City, N. J.
Fedders Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
Great Northern Mfg. Corp., Chicago, Ill.
Hotpoint, Chicago, Ill. (with heating element)
International Harvester Co., Chicago, Ill.
I. W. Air Conditioning Corp., New York, N. Y.
Kelvinator Div., American Motors Corp., Detroit, Mich.
King Refrigerator Co., Glendale, N. Y.
Mathes Co., The, Div. Glen Alden Corp., Ft. Worth, Tex.
Mitchell Mfg. Co., Chicago, Ill.
National Engineering & Mfg. Co., Sedalia, Mo.
Philco Corp., Philadelphia, Pa. (heating element available)
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Sutton Corp., O. A., The, Wichita, Kan.
Viking Mfg. Corp., Cleveland, O. (heating element optional)
Westinghouse Electric Corp., Electric Appliance Divisions, Columbus, O. (with or without heating element)
Whirlpool Corp., St. Joseph, Mich.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, WINTER, ROOM TYPE, FLOOR CABINET

Self contained blower, filter, heating coil, humidifier unit

Air Conditioning Engineering Co., Cambridge.
Air & Refrigeration Corp., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bal-Air, Inc., Nashvile, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Clarage Fan Co., Kalamazoo, Mich.
Dalzen Mfg. Co., St. Clair, Mich.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Johnson Co., S. T., Oakland, Calif.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, YEAR AROUND, FAN-COIL TYPE, FOR INSTALLATION WITH OR WITHOUT CABINET IN ROOM, OR IN CLOSET SPACE, OVER CORRIDOR, ETC.

Comprises Blower, Chilled Water Direct Expansion or Hot Water Coil, for Connection to Remote Compressor or Chilled Water Supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge.
Airtherm Mfg. Co., St. Louis, Mo.
American-Standard Plumbing & Heating Div., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Blissfield Mfg. Co., Blissfield, Mich.
Brown Products Corp., Union, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Chicago Steel Furnace Co., Chicago, Ill.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Deansteel Products Co., San Antonio, Texas
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Heating Div., Trenton, N. J.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Ilg Electric Ventilating Co., Chicago, Ill.
International Mfg. Co., Oklahoma City, Okla.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Payne Company, La Puente, Calif.
Peerless of America, Inc., Chicago, Ill.
Recold Corp., Los Angeles, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Temtrol, Inc., Okarche, Okla.
Trane Co., The, La Crosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Viking Mfg. Corp., Cleveland, O.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Witt Co., A. H., Los Angeles, Calif.
Worthington Corp., East Orange, N. J.
Wright Mfg. Co., Phoenix, Ariz.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, YEAR AROUND, HEAT PUMP (Reverse Refrigeration Cycle)

Addison Products Co., Addison, Mich.
American Coils Co., Farmingdale, N. J.
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Blissfield Mfg. Co., Blissfield, Mich.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Cobell Industries, Inc., Cleburne, Tex.
Drying Systems Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Buffalo, N. Y.
Flynn Mfg. Co., Michael, Philadelphia, Pa.
General Electric Co., Air Conditioning Dept., Tyler, Tex.
Gibson Refrigerator Co., Greenville, Mich.
I.C.E.D., Inc., St. Petersburg, Fla.
Lennox Industries Inc., The, Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
Mathes Co., The, Div. Glen Alden Corp., Houston, Tex.
McMillan Comfortaire, Inc., Jacksonville, Fla.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Typhoon Heat Pump Co., Div. of Hupp Corp., Tampa, Fla.
Weather King of Florida, Inc., Orlando, Fla.
Wright Mfg. Co., Phoenix, Ariz.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Self contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply, and steam or hot water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.

Airtron Corp., Div. of the Higgins Metal Products Co., Swanton, O.
American Coils Co., Farmingdale, N. J.
Auburn Burner Co., Auburn, Ind.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Union, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Circle Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Hastings Air Control, Inc., Omaha, Nebr.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Ilg Electric Ventilating Co., Chicago, Ill.
Johnson Co., S. T., Oakland, Calif.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Delaware, O.
Westcott Snyder Mfg. Corp., Madison, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., East Orange, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITARY AIR CONDITIONERS, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Self Contained Compressor, Blower, Filter, Cooling Coils and Heating Coils for Connection to Steam or Hot Water Supply

American Coils Co., Farmingdale, N. J.
American-Standard Plumbing & Heating Div., New York, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dialatemp, Inc., St. Louis, Mo.
General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Veco Products Co., Glenside, Pa.
Webster & Co., Warren, Camden, N. J.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

UNITARY AIR CONDITIONERS, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION

Self-Contained Cooling and Heating Coil, Filter, Etc. for Connection to High Pressure Primary Air Supply, Cold Water Supply, and Hot Water Supply

American-Standard Industrial Div., Detroit, Mich.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Carrier Corp., Syracuse, N. Y.
Mueller Climatrol, Div. of Worthington Corp., Milwaukee, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Trane Co., The, La Cross, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.
Worthington Corp., East Orange, N. J.

UNITS, AIR CONDITIONING

See Unitary Air Conditioners

UNITS, CONDENSATE DISPOSAL, FOR AIR CONDITIONING

See Pumps, Condensate, For Removing Condensation from Air Conditioning Units

UNITS, EXHAUSTER, CENTRIFUGAL FAN

Airfan Engineering Co., Los Angeles, Calif.
Ammerman Co., Inc., Stillwater, Minn.
Barry Blower Co., Minneapolis, Minn.
Brundage Co., The, Kalamazoo, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Carnes Corp., Verona, Wis.
Clarage Fan Co., Kalamazoo, Mich.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Jenn-Air Products Co., Indianapolis, Ind.
Master Fan Corp., Los Angeles, Calif.
Nesbitt Co., John J., Philadelphia, Pa.
Power Engineering Corp., Mingo Jct., O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Quickdraft Corp., Canton, O.
Robinson Ventilating Co., Zelienople, Pa.
United States Air Conditioning Corp., Delaware, O.

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

Ace Engineering Co., Chicago, Ill.
Alco Products, Inc., Schenectady, N. Y.
Barclay, Inc., Robert, Chicago, Ill.
Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Drying Systems Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Faber Engineer Co., Inc., Norristown, Pa.
Hauck Mfg. Co., Brooklyn, N. Y.
Hite Mfg. Co., N. E., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reliable Products Mfg. Co., Inc., Brooklyn, N. Y.
Schurs Oil Burner Co., Los Angeles, Calif.
Staples & Pfeiffer, San Francisco, Calif.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tuthill Pump Co., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Webster Electric Co., Racine, Wis.
Wiegand Co., Edwin L., Pittsburgh, Pa. (electric)
Wilson Engineering Corp., Chicago, Ill.
Yula Corp., Bronx, N. Y.

UNITS, HEAT RECOVERY, AIR-TO-AIR

Therm-O-Wheel, Inc., Long Island City, N. Y.

UNITS, HEATING AND VENTILATING, HORIZONTAL PACKAGE TYPE

Aerovent Fan Co., Inc., Piqua, O.
Airfan Engineering Co., Los Angeles, Calif.
Arkos Mfg. Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Chicago Steel Furnace Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Kennard Products, American Air Filter Co., Inc., Louisville, Ky.
Master Fan Corp., Los Angeles, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nesbitt Co., John J., Philadelphia, Pa.
Recold Corp., Los Angeles, Calif.
Rittling Corp., The, Buffalo, N. Y.
Temtrol, Inc., Okarche, Okla.
Thermal Engineering Corp., Houston, Tex.
Valveblower Co. of Calif., Santa Fe Springs, Calif.

UNITS, MAKEUP AIR, HEATING AND VENTILATING, HORIZONTAL PACKAGE TYPE, DIRECT-FIRED, GAS

(For Furnishing Preheated Outdoor Air to Replace Exhausted Air)

Aerovent Fan Corp., Piqua, O.
Arkos Mfg. Co., Detroit, Mich.
Burdett Mfg. Co., Chicago, Ill.
Campbell, Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Hartzell Propeller Fan Co., Piqua, O.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lennox Industries, Inc., Des Moines, Ia.
National Heater Co., Inc., St. Paul, Minn.
Tjernlund Mfg. Co., St. Paul, Minn.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

UNITS, MAKEUP AIR, HEATING AND VENTILATING, HORIZONTAL PACKAGE TYPE, DIRECT-FIRED, OIL

(For Furnishing Preheated Outdoor Air to Replace Exhausted Air)

Aerovent Fan Corp., Piqua, O.
Arkos Mfg. Co., Detroit, Mich.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Hartzell Propeller Fan Co., Piqua, O.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lennox Industries, Inc., Des Moines, Ia.
National Heater Co., Inc., St. Paul, Minn.
Tjernlund Mfg. Co., St. Paul, Minn.

UNITS, MAKEUP AIR, HEATING AND VENTILATING, HORIZONTAL PACKAGE TYPE, STEAM OR HOT WATER

(For Furnishing Preheated Outdoor Air to Replace Exhausted Air)

Airfan Engineering Co., Los Angeles, Calif.
Clarage Fan Co., Kalamazoo, Mich.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Wing Mfg. Co., L. J., Div. of Aero-Supply Mfg. Co., Inc., Linden, N. J.

UNITS, MIXING, SOUND AND VOLUME CONTROL, FOR DOUBLE DUCT HIGH VELOCITY AIR CONDITIONING SYSTEM

Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Connor Engineering Corp., Danbury, Conn.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Thermotank, Inc., Products Div., Detroit, Mich.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.

UNITS, STERILIZING, AIR

Air Purification Service, Inc., New York, N. Y.
Barnebey-Cheney Co., Columbus, O. (with activated charcoal)
Cambridge Filter Corp., Syracuse, N. Y.
Cooper Hewitt Electric Co., Div. of Sperti Faraday, Inc., Hoboken, N. J.
Fuller Co., D. William, Chicago, Ill.
Germatrol Corp., Pittsburgh, Pa.

Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.
Sampson Scientific Co., Div. of the Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti Faraday, Inc., Hoboken, N. J.

UNITS, STERILIZING, WATER

Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Mfg. Co., Chicago, Ill.
Gaffers & Sattler, Los Angeles, Calif.
Ilg Electric Ventilating Co., Chicago, Ill.
Meir Electric, Indianapolis, Ind.
Reed Unit-Fans, Inc., New Orleans, La.
Standard Electric Mfg. Co., West Berlin, N. J.

UNIVERSAL JOINTS

See Joints, Universal, for Operating Valves

VACUUM CLEANERS FOR BOILERS

See Cleaners, Vacuum, for Boilers

VACUUM CLEANING SYSTEMS, FITTINGS FOR

See Fittings for Central Vacuum Cleaning Systems

VACUUM GAGES

See Gages, Indicating, Vacuum

VACUUM HEATING SYSTEMS

See System, Heating, Vacuum

VACUUM PUMPS

See Pumps, Vacuum

VACUUM RECORDERS

See Recorders, Pressure and Vacuum

VALVE COVERS

See Covers, Protective, Valve and Flange

VALVE OPERATORS

See Operators, Valve

VALVE REPAIR KITS

See Kits, Repair for Pipes, Tanks, Valves, Flanges, and Ducts

VALVE RESEATERS

See Reseaters, Valve

VALVES, AIR OPERATING

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
American Moistening Co., Cleveland, N. C.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barksdale Valves, Los Angeles, Calif.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Dahl, Co., Inc., G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Corp., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edward Valves, Inc., East Chicago, Ind.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gardner-Denver Co., Quincy, Ill.
General-American Valve Co., Corona Del Mar, Calif.
General Controls Co., Glendale, Calif.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hanna Engineering Wks., Chicago, Ill.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt Valve Co., Salem, O.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ledeen Mfg. Co., El Monte, Calif.
Leslie Co., Lyndhurst, N. J.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Norgren Co., C. A., Englewood, Colo.
OPW-Jordan, Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Corp., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Republic Mfg. Co., Cleveland, O.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Rockwood Sprinkler Co., Worcester, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Sinclair-Collins Valve Co., Akron, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uniflow Valve Corp., Cranford, N. J.
Velan Valve Corp., Plattsburgh, N. Y.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, ALTITUDE

Cla-Val Co., Newport Beach, Calif.
Davis Regulator Co., Chicago, Ill.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Ross Valve Mfg. Co., Inc., Troy, N. Y.

VALVES, ANGLE

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bordo Co., Inc., L. J., Glenside, Pa. (Plug)
California Brass Mfg. Co., Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Newport Beach, Calif.
Cleveland Brass Mfg. Co., The, Kinsman, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Deutsch Controls Corp., Los Angeles, Calif.
Duriron Co., The, Dayton, O. (corrosion resisting)
Edward Valves, Inc., East Chicago, Ind.
Electric Boat Div., General Dynamics Corp., Groton, Conn.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Gas Machinery Co., Cleveland, O.
General American Valve Co., Corona Del Mar, Calif.
General Ceramics Corp., Keasbey, N. J. (porcelain; plastic, alumina)
General Controls Co., Glendale, Calif. and Skokie, Ill.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hammond Valve Corp., Hammond, Ind.
Haveg Industries, Inc., Wilmington, Del. (plastic and plastic body)
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Corp., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard Rubber)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Sarcotherm Controls, Inc., New York, N.Y.
Schaible Co., The, Mariemont, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., Florham Park, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Uniflow Valve Corp., Cranford, N. J.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Velan Valve Corp., Plattsburgh, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.

VALVES, AUTOMATIC SHUTOFF WITH MANUAL RESET

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.

Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Baso, Inc., Milwaukee, Wis.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Coppus Engineering Corp., Worcester, Mass.
Dahl Co., Inc., G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electronics Corp. of America, Cambridge, Mass.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Maxon Premix Burner Co., Muncie, Ind.
McRae Specialty Co., Don, Glendale, Calif.
North American Mfg. Co., Cleveland, O.
OPW-Jordan, Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Patrol Valve Co., The, Cleveland, O.
Penn Controls, Inc., Goshen, Ind.
Rockwell Co., W. S., Fairfield, Conn.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Security Valves Corp., So. Pasadena, Calif.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Sinclair-Collins Valve Co., Akron, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Thermac Co., Corona, Calif.
Valco, Inc., Cincinnati, O.
Valcor Engineering Corp., Kenilworth, N. J.
Watts Regulator Co., Lawrence, Mass.
White-Rodgers Co., St. Louis, Mo.

VALVES, AUTOMATIC, STOP AND CHECK

Chatleff Valve & Mfg. Co., Austin, Tex.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineeering Div., General Controls Co., Warwick, R. I.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Scott Valve Mfg. Co., Detroit, Mich.
Sinclair-Collins Valve Co., Akron, O.
Velan Valve Corp., Plattsburgh, N. Y.

VALVES, BACK PRESSURE

American-Standard Detroit Controls Div., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Dahl Co., Inc., G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electric Boat Div., General Dynamics Corp., Groton, Conn.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Granberg Corp., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hersey-Sparling Meter Co., Dedham, Mass.

Hubbell Corp., Mundelein, Ill.
Josam Manufacturing Co., Michigan City, Ind.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
OPW-Jordan, Cincinnati, O.
Pokorney Mfg. Co., Chicago, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schancke, Inc., Evansville, Ind.
Schutte and Koerting Co., Buck County, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Stickle Steam Specialties Co., Indianapolis, Ind.
Stockham Valves & Fittings, Birmingham, Ala.
Uniflow Valve Corp., Cranford, N. J.
Zurn Industries, Inc., Erie, Pa.

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS

American-Standard Detroit Controls Div., Detroit, Mich.
Bell & Gossett Co., Morton Grove, Ill.
DeZurik Corp., Sartell, Minn.
Eagle Copper Products Co., Inc., Brooklyn, N. Y.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Valve Corp., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Panel Heat, Inc., Copiague, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

VALVES, BALL TYPE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Cardox Corp., Chicago, Ill.
Carpenter Sales Corp., Cleveland, O.
Chemtrol, Lynwood, Calif. (plastic)
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Greer Hydraulics, Inc., Jamaica, N. Y.
Jamesbury Corp., Worcester, Mass.
Lunkenheimer Co., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Rockwood Sprinkler Co., Worcester, Mass.
Smith Co., S. Morgan, York, Pa.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, BAR STOCK

Alloy Steel Products Co., Linden, N. J. (stainless steel)
Associated Valve Co., North Wales, Pa.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Autoclave Engineers Sales Corp., Erie, Pa.
Carpenter Sales Corp., Cleveland, O.
Circle Seal Products Co., Inc., Pasadena, Calif.

Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Deutsch Controls Corp., Los Angeles, Calif.
Farris Engineering Corp., Palisades Park, N. J.
Foxboro Co., Foxboro, Mass.
General-American Valve Co., Corona Del Mar, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Guardian Products Corp., Michigan City, Ind.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Henry Valve Co., Melrose Park, Ill.
Jamesbury Corp., Worcester, Mass.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
National Airoil Burner Co., Inc., Philadelphia.
New England Valve Co., Worcester, Mass.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwood Sprinkler Co., Worcester, Mass.
Shank Co., Cyrus, Chicago, Ill.
Star Stainless Screw Co., Paterson, N. J.
Uehling Instrument Co., Paterson, N. J.
Uniflow Valve Corp., Cranford, N. J.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, BLOW-OFF

Bordo Co., Inc., L. J., Glenside, Pa.
Chatleff Valve & Mfg. Co., Austin, Tex.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Gato Valve Co., Pittsburgh, Pa.
General-American Valve Co., Corona Del Mar, Calif.
Henszey Co., Watertown, Wis.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Shank Co., Cyrus, Chicago, Ill.
Strong, Carlisle & Hammond, Conneaut, O.
Velan Valve Corp., Plattsburgh, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES, BOILER, NON-RETURN

Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Schutte & Koerting Co., Buck County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.
Walworth Co., New York, N. Y.

VALVES, BRAZED END

Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammond Valve Corp., Hammond, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Pittsburgh Valve Co., Reedsville, W. Va.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Superior Valve & Fittings Co., Pittsburgh.
Walworth Co., New York, N. Y.

VALVES, BUTTERFLY

Airaterra (Roylyn Products), Glendale, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Builders-Providence Div., B-I-F Industries Inc., Providence, R. I.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Company Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Fabri-Valve Co. of America, Portland, Ore.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Gas Machinery Co., Cleveland, O.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware, plastic)
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hauck Mfg. Co., Brooklyn, N. Y.
Keystone Valve Corp., Houston, Tex.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y. (all iron for gas service 16 in. and up)
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
North American Mfg. Co., Cleveland, O.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schurs Oil Burner Co., Los Angeles, Calif.
Schutte & Koerting Co., Buck County, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.
Worthington Corp., East Orange, N. J.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc., Benicia, Calif.

VALVES, BYPASS, WITH PROVISIONS FOR SOME CIRCULATION WHEN CLOSED

Chatleff Valve & Mfg. Co., Austin, Tex.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Dahl Co., Inc., G. W., Bristol, R. I.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Morrison Brothers Co., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Ranco Incorporated, Columbus, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Schutte & Koerting Co., Buck County, Pa.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings, Birmingham, Ala.
Uniflow Valve Corp., Cranford, N. J.
Velan Valve Corp., Plattsburgh, N. Y.

VALVES, CHECK — CHECK UNIT ONLY, FOR USE WITH PIPE FITTINGS

Durabla Mfg. Co., New York, N. Y.
Harman Equipment Co., Los Angeles, Calif.
OPW-Jordan, Cincinnati, O.
Superior Valve & Fittings Co., Pittsburgh, Pa.

VALVES, CHECK

Airaterra (Roylyn Products), Glendale, Calif.
Alloy Steel Products Co., Linden, N. J. (stainless steel)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Hard rubber)
American-Standard Detroit Controls Div., Detroit, Mich.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich. (Refrigeration)
Anderson Brass Co., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Autoclave Engineers Sales Corp., Erie, Pa.
Barrett Haentjens & Co., Hazleton, Pa.
Beacon Brass Co., Waltham, Mass.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Chatleff Valve & Mfg. Co., Austin, Tex.
Chemtrol, Lynwood, Calif. (plastic)
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill.
Cochrane Corp., Philadelphia, Pa.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (plastic)
Combination Pump Valve Co., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Dynametrics Corp., Burlington, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Gas Machinery Co., Cleveland, O.
General Ceramics Corp., Keasbey, N. J. (ceramics)
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammond Valve Corp., Hammond, Ind.
Harman Equipment Co., Los Angeles, Calif.
Henry Valve Co., Melrose Park, Ill.
Hersey-Sparling Meter Co., Dedham, Mass.
Imperial Brass Mfg. Co., Chicago, Ill.
Integral Corp., Hicksville, Long Island, N. Y.
Jenkins Bros., New York, N. Y.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kepner Products Co., Summit, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Keystone Valve Corp., Houston, Tex.
LaBour Co., Inc., The, Elkhart, Ind.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber & rigid PVC)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green Inc., Cleveland, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Miller Valve Co., Inc., Pittsburgh, Pa. (Silent)
Milwaukee Valve Co., Milwaukee, Wis.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Myers & Bro. Co., F. E., The, Ashland, O.
Nuclear Products Co., Cleveland, O.
OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Phillips & Co., H. A., Chicago, Ill.
Pokorney Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Remco, Inc., Zelienople, Pa. (high pressure & low pressure)
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Schaible Co., The, Mariemont, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealed Unit Parts Co., Inc., New York, N. Y.
Sealol Corp., Providence, R. I.
Sinclair-Collins Valve Co., Akron, O.
Smith Co., S. Morgan, York, Pa.
Smolensky Valve Co., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Valve and Fittings Co., Pittsburgh.
Techno Corp., Erie, Pa.
Tesco, Inc., Tulsa, Okla.
Universal Valve Co., Elizabeth, N. J.
Valves, Inc., F. G., Milwaukee, Wis.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Velan Valve Corp., Plattsburgh, N. Y.
Walworth Co., New York, N. Y.
Watkins Co., J. E., Maywood, Ill.
Watsco, Inc., Hialeah, Fla.
Watts Regulator Co., Lawrence, Mass.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (silent)

VALVES, CHECK, BRONZE

Airaterra (Roylyn Products), Glendale, Calif.
American-Standard Detroit Controls Div., Detroit, Mich.
Anderson Brass Co., Detroit, Mich.
Barrett Haentjens & Co., Hazleton, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill
Combination Pump Valve Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Hammond Valve Corp., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Ladish Co., Cudahy, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Miller Valve Co., Inc., Pittsburgh, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia.
Morse-Smith-Morse Co., The, Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Myers & Bro. Co., F. E., The, Ashland, O.
Nibco, Inc., Elkhart, Ind.

OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Pokorney Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Schaible Co., The, Mariemont, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealol Corp., Providence, R. I.
Sims Pump Valve Co., Hoboken, N. J.
Sinclair-Collins Valve Co., Akron, O.
Smolensky Valve Co., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Tesco, Inc., Tulsa, Okla.
Valves, Inc., F. G., Milwaukee, Wis.
Walworth Co., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., Pittsburgh, Pa.

VALVES, CHECK, IRON

Airaterra (Roylyn Products), Glendale, Calif.
Barrett Haentjens & Co., Hazleton, Pa.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Combination Pump Valve Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y. (body bronze trimmed)
Lunkenheimer Co., Cincinnati, O.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
Miller Valve Co., Inc., Pittsburgh, Pa.
Mueller Co., Decatur, Ill.
OPW-Jordan, Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Phillips & Co., H. A., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Reading, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealol Corp., Providence, R. I.
Sinclair-Collins Valve Co., Akron, O.
Smolensky Valve Co., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Techno Corp., Erie, Pa.
Tesco, Inc., Tulsa, Okla.
Valves, Inc., F. G., Milwaukee, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, CHECK, STEEL

Airaterra (Roylyn Products), Glendale, Calif.
Associated Valve Co., North Wales, Pa.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill.
Combination Pump Valve Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve & Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kepner Products Co., Summit, Ill.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Inc., Cleveland, O.
Miller Valve Co., Inc., Pittsburgh, Pa.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sealol Corp., Providence, R. I.
Sinclair-Collins Valve Co., Akron, O.
Smolensky Valve Co., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Techno Corp., Erie, Pa.
Tesco, Inc., Tulsa, Okla.
Velan Valve Corp., Plattsburgh, N. Y.
Vernon Tool Co., Ltd., Alhambra, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watkins Co., J. E., Maywood, Ill.
Williams Gauge Co., Inc., The, Pittsburgh.

VALVES, COMPRESSOR

Binks Mfg. Co., Chicago, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Detroit Stamping Co., Detroit, Mich.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
OPW-Jordan, Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pokorney Mfg. Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techno Corp., Erie, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y. (suction and discharge)
Watsco, Inc., Hialeah, Fla.
Williams Gauge Co., Inc., The, Pittsburgh,

VALVES, CONTINUOUS BOILER BLOWDOWN

Cochrane Corp., Philadelphia, Pa.
General-American Valve Co., Corona Del Mar, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Kaye & MacDonald, Inc., West Orange, N. J.

VALVES, CYLINDER OPERATED

Airmatic Valve Inc., Cleveland, O.
Alloy Steel Products Co., Linden, N. J. (stainless steel)
Associated Valve Co., North Wales, Pa.
Automatic Switch Co., Florham Park, N. J.
Cardox Corp., Chicago, Ill.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clow & Sons, Inc., James B., Chicago, Ill.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Corp., Sartell, Minn.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General-American Valve Co., Corona Del Mar, Calif.
Hamer Valves Inc., Long Beach, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt Valve Co., Salem, O.
Jamesbury Corp., Worcester, Mass.
Jenkins Bros., New York, N. Y.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Sinclair-Collins Valve Co., Akron, O.
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh Pa.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, DIAPHRAGM (Diaphragm controller elements controls opening of valve)

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Aqua Matic, Inc., Rockford, Ill.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bellofram Corp., Burlington, Mass.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Dahl Co., Inc., G. W., Bristol, R. I.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Farris Engineering Corp., Palisades Park, N. J.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
General Controls Co., Glendale, Calif.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hills-McCanna Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.

Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Mueller Co., Decatur, Ill.
North American Mfg. Co., Cleveland, O.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
OPW-Jordan, Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (plain and jacketed)
Patrol Valve Co., The, Cleveland, O.
Paul Valve Corp., New York, N. Y.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Sinclair-Collins Valve Co., Akron, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Trerice Co., H. O., Detroit, Mich.
Uniflow Valve Corp., Cranford, N. J.
United States Rubber Co., New York, N. Y.
Valves, Inc., F. G., Milwaukee, Wis.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, DIAPHRAGM
(Diaphragm itself throttles or shuts off flow)

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Florham Park, N. J.
Automotive Rubber Co., Inc., Detroit, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Baso, Inc., Milwaukee, Wis.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Chatleff Valve & Mfg. Co., Austin, Tex.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Corp., Philadelphia, Pa.
Dahl Co., Inc., G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General-American Valve Co., Corona Del Mar, Calif.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Hunt Valve Co., Salem, O.
Johnson Corp., The, Three Rivers, Mich.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
Norgren Co., C. A., Englewood, Colo.
Rockwell Co., W. S., Fairfield, Conn.
Sall Bros. Co., Rockford, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., So. Pasadena, Calif.
Sinclair-Collins Valve Co., Akron, O.
Sullivan Valve & Engrg. Co., Butte, Mont.
Trerice Co., H. O., Detroit, Mich.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded UPVC)
Uniflow Valve Corp., Cranford, N. J.
United States Rubber Co., New York, N. Y.
Walworth Co., New York, N. Y. (plastic PVC diaphragm)
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
White-Rodgers Co., St. Louis, Mo.

VALVES, DIAPHRAGM
(Diaphragm used as seal between body and bonnet)

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Arco Products, Automotive Rubber Co., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Corp., Philadelphia, Pa.
Coppus Engineering Corp., Worcester, Mass.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Duriron Co., Inc., The, Dayton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Goodrich Industrial Products Co., B. F., Akron, O. (rubber lined)
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Haveg Industries, Inc., Wilmington, Del.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Knight, Maurice A., Akron, O. (molded resin for acids)
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Brass Co., Port Huron, Mich.
OPW-Jordan, Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Security Valves Corp., So. Pasadena, Calif.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trane Co., The, La Crosse, Wis.
Uniflow Valve Corp., Cranford, N. J.
United States Rubber Co., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL

Allen Mfg. Co., W. D., Bellwood, Ill.
American District Telegraph Co., New York, N. Y.
Automatic Switch Co., Florham Park, N. J.
Coppus Engineering Corp., Worcester, Mass.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hersey-Sparling Meter Co., Dedham, Mass.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Mueller Co., Decatur, Ill.
Okadee Co., Chicago, Ill.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Security Valves Corp., So. Pasadena, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Valco, Inc., Cincinnati, O.
Zurn Industries, Inc., Erie, Pa.

VALVES, FLOAT

A-P Controls Div., Controls Co. of America, Milwaukee, Wis. (Oil)
Alco Valve Co., St. Louis, Mo.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Hard rubber)
American Moistening Co., Cleveland, N. C.
American-Standard Detroit Controls Div., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Boylston Steam Specialty Co., Chicago, Ill.
Cla-Val Co., Newport Beach, Calif.
Cleveland Humidifier Co., Cleveland, O.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Cochrane Corp., Philadelphia, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Eddy Valve Co., Waterford, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Frick Co., Waynesboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hubbell Corp., Mundelein, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Keckley Co., O. C., Skokie, Ill.
Ken-Ray Brass Products, Inc., Vermont, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morey, Dan, Los Angeles, Calif. (for evaporative coolers and cooling towers)
Multiplex Mfg. Co., Berwick, Pa.
Phillips & Co., H. A., Chicago, Ill.
Robert Mfg. Co., Los Angeles, Calif.
Rockwell Co., W. S., Fairfield, Conn.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Shade Valve Mfg. Co., Philadelphia, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scoville Mfg. Co., Waterbury, Conn.

Skuttle Mfg. Co., Milford, Mich.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis.
Taco Heaters, Inc., Cranston, R. I.
TOT Towers Co., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Valves, Inc., F. G., Milwaukee, Wis.
Vanton Pump & Engineering Corp., Hillside, N. J. (plastic)
Wabash Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, FLOAT AND LEVER BALANCED

Atlas Valve Co., Newark, N. J.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
McAlear Mfg. Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

American Flow Control Corp., Houston, Tex.
Automatic Switch Co., Florham Park, N. J.
Barber-Colman Co., Rockford, Ill.
Beacon Brass Co., Waltham, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Clark-Cooper Co., Inc., CC Pump Div., Palmyra, N. J.
Conoflow Corp., Subsid. of Walworth Co., Philadelphia, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
DeZurik Corp., Sartell, Minn.
Dunham-Bush, Inc., West Hartford, Conn.
Econo Products Company, Inc., Div. of Viking **Instruments, Inc., East Haddam, Conn.**
Edgewood Mfg. Co., El Monte, Calif.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hayes Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Kates Co., W. A., Deerfield, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Metalmaster Corp., Newark, N. J.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Rockwell Co., W. S., Fairfield, Conn.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Valve Controls Co., North Hollywood, Calif.
Velan Valve Corp., Plattsburgh, N. Y.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.
White-Rodgers Co., St. Louis, Mo.

VALVES, FLUSH, BOTTOM TANK

Cooper Alloy Corp., Hillside, N. J.
Ladish Co., Cudahy, Wis.
Luzerne Rubber Co., Trenton, N. J. (hard rubber)

Powell Co., Wm., The, Cincinnati, O.

VALVES, FORGED STEEL

Alco Products, Inc., Schenectady, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Atlas Valve Co., Newark, N. J.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Corp., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Lenz Co., Dayton, O.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh.
Taylor Instrument Companies, Rochester, N. Y.
Velan Valve Corp., Plattsburgh, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Worcester Valve Co., Inc., Worcester, Mass.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES, FUEL OIL, METERING

American-Standard Detroit Controls Div., Detroit, Mich.
Automatic Switch Co., Florham Park, N. J.
Hauck Mfg. Co., Brooklyn, N. Y.
Henry Valve Co., Melrose Park, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.

VALVES, GATE, ALLOY

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dia-Plug Valve Corp., Buffalo, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Hamer Valves Inc., Long Beach, Calif.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Corp., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Milwaukee Valve Co., Milwaukee, Wis.
New England Valve Corp., Worcester, Mass.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
OPW-Jordan Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
Velan Valve Corp., Plattsburgh, N. Y.
Walworth Co., New York, N. Y.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, GATE, ALUMINUM

Allegheny Valve Co., Warren, Pa.
American Flow Control Corp., Houston, Tex.
Darling Valve & Mfg. Co., Williamsport, Pa.
Hamer Valves Inc., Long Beach, Calif.
Milwaukee Valve Co., Milwaukee, Wis.
OPW-Jordan Corp., Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, GATE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
American-Standard Detroit Controls Div., Detroit, Mich.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Darling Valve Mfg. Co., Williamsport, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Hamer Valves Inc., Long Beach, Calif.
Hammond Valve Corp., Hammond, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Tin lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
Prier Brass Mfg. Co., Kansas City, Mo.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockford Brass Works, Rockford, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Schaible Co., The, Mariemont, O.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Walworth Co., New York, N. Y.

VALVES, GATE, IRON BODY

Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Corp., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Gas Machinery Co., Cleveland, O.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rich Mfg. Co. of California, Los Angeles, Calif.
Rockwell Co., W. S., Fairfield, Conn.
Scott Valve Mfg. Co., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, GATE, MALLEABLE IRON

Crane Co., Chicago, Ill.

Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.

VALVES, GATE, STEEL

Alco Products, Inc., Schenectady, N. Y.
Allegheny Valve Co., Warren, Pa.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Cameron Iron Works, Inc., Houston, Tex.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Corp., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Grove Valve and Regulator Co., Oakland, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined)
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
New England Valve Corp., Worcester, Mass.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
Velan Valve Corp., Plattsburgh, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALLOY

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Associated Valve, North Wales, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Greer Hydraulics, Inc., Jamaica, N. Y.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn
Milwaukee Valve Co., Milwaukee, Wis.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., Florham Park, N. J.
Velan Valve Corp., Plattsburgh, N. Y.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALUMINUM

Dahl Co., Inc., G. W., Bristol, R. I.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.

VALVES, GLOBE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
American-Standard Detroit Controls Div., Detroit, Mich.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
California Brass Mfg. Co., Los Angeles.
Carpenter Sales Corp., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Newport Beach, Calif.
Cleveland Brass Mfg. Co., The, Kinsman, O.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hammond Valve Corp., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Mariemont, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., Florham Park, N. J.
Superior Valve & Fittings Co., Pittsburgh.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.

VALVES, GLOBE, IRON BODY

Automatic Timing & Controls, Inc., King of Prussia, Pa.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Dersch, Gesswein & Neuert, Inc., Chicago.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., Florham Park, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.

VALVES, GLOBE, MALLEABLE IRON

Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Powell Co., Wm., The, Cincinnati, O.

VALVES, GLOBE, STEEL

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
New England Valve Corp., Worcester, Mass.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., Florham Park, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Velan Valve Corp., Plattsburgh, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, INSTRUMENT

Airaterra (Roylyn Products), Glendale, Calif.
Associated Valve Co., North Wales, Pa.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Atlas Valve Co., Newark, N. J.
Autoclave Engineers Sales Corp., Erie, Pa.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Circle Seal Products Co., Inc., Pasadena, Calif.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Greer Hydraulics, Inc., Jamaica, N. Y.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Skokie, Ill.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Petrometer Corp., Long Island City, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Republic Mfg. Co., Cleveland, O.

Security Valves Corp., So. Pasadena, Calif.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.
Warren Engineering Co., Broadway, N. J.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, LINED

American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J. (Rubber lined)
Automatic Switch Co., Florham Park, N. J.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Corp., Sartell, Minn.
Division Lead Co., Summit, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Farris Flexible Valve Corp., Palisades Park, N. J.
Gates Engineering Co., Wilmington, Del.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Goodrich Industrial Products Co., B. F., Akron, O.
Grinnell Co., Inc., Providence, R. I.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Knapp Mills, Inc., Long Island City, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
National Lead Co., New York, N. Y. (Lead)
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O. (plastic)
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
United States Rubber Co., New York, N. Y. (rubber lined, metal)

VALVES, LUBRICATED PLUG

Crane Co., Chicago, Ill.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Hamer Valves Inc., Long Beach, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Ladish Co., Cudahy, Wis.
Mueller Co., Decatur, Ill.
Powell Co., William, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.

VALVES, MIXING, HOT AND COLD WATER

American-Standard Detroit Controls Div., Detroit, Mich.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beacon Brass Co., Waltham, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Dole Valve Co., The, Morton Grove, Ill.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
General Fittings Co., East Greenwich, R. I.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Holby Tempering Valve Co., Inc., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Klipfel Valves, Inc., Hamilton, O.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Raymanco Mfg. Co., Owatonna, Minn.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte & Koerting Co., Buck County, Pa.
Scovill Mfg. Co., Waterbury, Conn.
Strahman Valves, Inc., Florham Park, N. J.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Watts Regulator Co., Lawrence, Mass.
Wilson Engineering Corp., Chicago, Ill. (for controlling water temperature leaving process equipment)
Yula Corp., Bronx, N. Y.

VALVES, MIXING, HOT AND COLD WATER, THERMOSTATIC

American-Standard Detroit Controls Div., Detroit, Mich.
Atlas Valve Co., Newark, N. J.
Beacon Brass Co., Waltham, Mass.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Dole Valve Co., Morton Grove, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., East Greenwich, R. I.
Holby Tempering Valve Co., Inc., New York, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.
Leonard Valve Co., Cranston, R. I.
OPW-Jordan, Cincinnati, O.
Patrol Valve Co., The, Cleveland, O.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte & Koerting Co., Buck County, Pa.
Scovill Mfg. Co., Waterbury, Conn.
Symmons Mfg. Co., Boston, Mass.
Taco Heaters, Inc., Cranston, R. I.
Trerice Co., H. O., Detroit, Mich.
Vic Mfg. Co., Minneapolis, Minn.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
White-Rodgers Co., St. Louis, Mo.
Yula Corp., Bronx, N. Y.

VALVES, MIXING, STEAM AND WATER

Barber-Colman Co., Rockford, Ill.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Johnson Service Co., Milwaukee, Wis.
Klipfel Valves, Inc., Hamilton, O.
Leonard Valve Co., Cranston, R. I.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Strahman Valves, Inc., Florham Park, N. J.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Valve Controls Co., North Hollywood, Calif.
Vapor Heating Corp., Chicago, Ill.

VALVES, MOTOR OPERATED

Alloy Steel Products Co., Linden, N. J. (stainless steel)
Associated Valve Co., North Wales, Pa.
Au-Temp-Co Corp., New York, N. Y.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Belco Industrial Equipment Div., Bogue Electrical Mfg. Co., Paterson, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Cash Co., A. W., Decatur, Ill.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clark-Cooper Co., Inc., CC Pump Div., Palmyra, N. J.
Clow & Sons, Inc., James B., Chicago, Ill.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I. (air motor)
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Corp., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Edward Valves, Inc., East Chicago, Ind.
Edwards Engineering Corp., Pompton Plains, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hauck Mfg. Co., Brooklyn, N. Y.
Heat-Timer Corp., New York, N. Y.
Hills-McCanna Co., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Products, American Air Filter Co., Inc. Louisville, Ky.
Jamesbury Corp., Worcester, Mass.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Controls, Inc., Newton, Mass.
New England Gear Wks., Southington, Conn.
North American Mfg. Co., Cleveland, O.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Corp., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
Quality Specialty Corp., Inc., Camden, N. J.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Refrigerating Specialties Co., Chicago, Ill.
Regent Engineering Co., Wood Dale, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.

Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Buck County, Pa.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, NEEDLE

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Allin Mfg. Co., Inc., Chicago, Ill.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Meter Co., Inc., Philadelphia, Pa.
American-Standard Detroit Controls Div., Detroit, Mich.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Associated Valve Co., North Wales, Pa.
Autoclave Engineers Sales Corp., Erie, Pa.
Automatic Switch Co., Florham Park, N. J.
Binks Mfg. Co., Chicago, Ill.
Carpenter Sales Corp.. Cleveland. O.
Chemtrol, Lynwood, Calif. (plastic)
Commonwealth Brass Corp., Detroit, Mich.
Cooper Alloy Corp., Hillside, N. J.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, Pa.
Hammond Valve Corp., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ladish Co., Cudahy, Wis.
Lunkenheimer Co., Cincinnati, O.
Maid-O'-Mist, Inc., Chicago, Ill.
Madden Brass Products Co., Aurora, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Modern Engineering Co., St. Louis, Mo.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Norgren Co., C. A., Englewood, Colo.
Nuclear Products Co., Cleveland, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Reliable Products Mfg. Co., Inc., Brooklyn, N. Y.
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Spindler & Sons, Inc., August, Jersey City, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Torit Mfg. Co., St. Paul, Minn.
Uehling Instrument Co., Paterson, N. J.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Velan Valve Corp., Plattsburgh, N. Y.
Walworth Co., New York, N. Y.
Watkins Co., J. E., Maywood, Ill.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, NON-RETURN

Autoclave Engineers Sales Co., Erie, Pa.
Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Scott Valve Mfg. Co., Detroit, Mich.
Velan Valve Corp., Plattsburgh, N. Y.

VALVES, OXYGEN

Airaterra (Roylyn Products), Glendale, Calif.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cooper Alloy Corp., Hillside, N. J.
Dahl Co., Inc., G. W., Bristol, R. I.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt Valve Co., Salem, O.
Jamesbury Corp., Worcester, Mass.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Modern Engineering Co., St. Louis, Mo.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
Research Vacuum Supply Co., Chicago, Ill.
Schutte & Koerting Co., Buck County, Pa.
Security Valves Corp., So. Pasadena, Calif.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, PACKLESS

Associated Valve Co., North Wales, Pa.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General-American Valve Co., Corona Del Mar, Calif.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hanna Engineering Wks., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass. (vacuum)
Marsh Valve Co., Dunkirk, N. Y.
Mercoid Corp., The, Chicago, Ill.
OPW-Jordan, Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Spence Engineering Co., Inc., Walden, N. Y.
Superior Valve & Fittings Co., Pittsburgh.

VALVES, PILOT OPERATED

Alco Valve Co., St. Louis, Mo.
American Flow Control Corp., Houston, Tex.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Florham Park, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Carter Controls, Inc., Lansing, Ill.
Clark Mfg. Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
DeZurik Corp., Sartell, Minn.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hanna Engineering Works, Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hubbell Corp., Mundelein, Ill.
Hunt Valve Co., Salem, O.
Illinois Water Treatment Co., Rockford, Ill.
Jamesbury Corp., Worcester, Mass.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
OPW-Jordan, Cincinnati, O.
Phillips & Co., H. A., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte & Koerting Co., Buck County, Pa.
Security Valves Corp., So. Pasadena, Calif.
Sinclair-Collins Valve Co.. Akron, O.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Stickle Steam Specialties Co., Indianapolis.
Trerice Co., H. O., Detroit, Mich.
Valcor Engineering Corp., Kenilworth, N. J.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, PLASTIC

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Agile Corp., Bedford, O.
American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
American Vulcathene Div. Nalge Co., Inc., Rochester, N. Y. (polyethylene)
Argo Plastic Products, Cleveland, O.
Atlas Mineral Products Co., Mertztown, Pa.
Chemtrol, Lynwood, Calif.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (Diaphragm Valves)
Dahl Co., Inc., G. W., Bristol, R. I.
Dow Chemical Co., The, Midland, Mich. (saran-lined)
Goodrich Industrial Products Co., B. F., Akron, O. (rigid)
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O.
Grinnell Co., Inc., Providence, R. I.
Haveg Industries, Inc., Wilmington, Del.
Hills-McCanna Co., Chicago, Ill.
Illinois Water Treatment Co., Rockford, Ill.
Industrial Plastic Fabricators, Inc., Norwood, Mass. (PVC)
Jamesbury Corp., Worcester, Mass.
Kraloy Plastic Pipe Co., Inc., Los Angeles, Calif.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lunkenheimer Co., Cincinnati, O. (PVC)
Luzerne Rubber Co., Trenton, N. J.
Mannesmann-Easton Plastic Products Co., Inc., Easton, Pa. (rigid, unplasticized polyvinyl chloride)
Nuclear Products Co., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Saran Lined Pipe Co., Ferndale, Mich, (saran)

Seelye Craftsmen, Inc., Minneapolis, Minn.
Skyline Industries Sales, Inc., Titusville, Pa.
Sloane Mfg. Co., Sun Valley, Calif.
Tube Turns Plastics Inc., Louisville, Ky. (PVC)
United States Rubber Co., New York, N. Y.
Valcor Engineering Corp., Kenilworth, N. J.
Vanton Pump & Equipment Corp., Hillside, N. J.
Walworth Co., New York, N. Y.

VALVES, PLUG

Alco Products, Inc., Schenectady, N. Y.
Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Ampco Metal, Inc., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Barrett Haentjens & Co., Hazleton, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
California Brass Mfg. Co., Los Angeles, Calif.
Cameron Iron Works, Inc., Houston, Tex.
Circle Seal Products Co., Inc., Pasadena, Calif.
Clow & Sons, Inc., James B., Chicago, Ill.
Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O. (plastic)
Cooper Alloy Corp., Hillside, N. J.
Continental Mfg. Co., Cincinnati, O.
Corning Glass Works, Corning, N. Y.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
De Zurik Corp., Sartell, Minn. (eccentric plug)
Duriron Co., Inc., Dayton, O. (corrosion resisting)
Faber Engineering Co., Inc., Norristown, Pa.
Fabri-Valve Co. of America, Portland, Ore.
Gato Valve Co., Pittsburgh, Pa.
General Ceramics Corp., Keasbey, N. J. (Chemical stoneware & porcelain)
Gilbert Brass Foundry Co., St. Louis, Mo.
Hamer Valves Inc., Long Beach, Calif.
Hays Mfg. Co., Erie, Pa.
Hetherington & Berner, Inc., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jamesbury Corp., Worcester, Mass.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Knight, Maurice A., Akron, O. (Stoneware for acids)
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard (rubber and rigid PVC)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Reynolds Water Conditioning Co., Detroit.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Texsteam Corp., Houston, Tex. (non-lubricated)
Thermac Co., Corona, Calif.
Tube Turns Plastics, Inc., Louisville, Ky. (Injection molded UPVC)
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Victaulic Co. of America, Elizabeth, N. J.
Vogt Machine Co., Henry, Louisville, Ky.
W-K-M, Div. of ACF Industries, Inc., Houston, Tex.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVE POSITION INDICATORS

See Indicators, Valve, Position

VALVES, PRESSURE REDUCING AND PRESSURE RELIEF, WATER

(Including Provisions for Emergency Boiler Feeding)

Airmatic Valve, Inc., Cleveland, O.
American Flow Control Corp., Houston, Tex.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Div., General Controls Co., Warwick, R. I.
General Controls Co., Glendale, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Instruments, Inc., Tulsa, Okla.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Leslie Co., Lyndhurst, N. J.
Milton Roy Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Sall Bros. Co., Rockford, Ill.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Squires Co., C. E., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
Valves, Inc., F. G., Milwaukee, Wis.
Watts Regulator Co., Lawrence, Mass.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
American Car & Foundry Div. of ACF Industries, Inc., New York.
American Flow Control Corp., Houston, Tex.
American Meter Co., Inc., Philadelphia, Pa.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Autoclave Engineers Sales Corp., Erie, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hanna Engineering Wks., Chicago, Ill.
Harris Calorific Co., The, Cleveland, O.
Hauck Mfg. Co., Brooklyn, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Englewood, Colo.
OPW-Jordan, Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Strong, Carlisle & Hammond, Conneaut, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Uehling Instrument Co., Paterson, N. J.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, PRESSURE REDUCING AND REGULATING, HOT WATER

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Airmatic Valve Inc., Cleveland, O.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Mfg. Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.

Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
OPW-Jordan, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Conneaut, O.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Valves, Inc., F. G., Milwaukee, Wis.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.

VALVES, PRESSURE REDUCING AND REGULATING, LIQUID

Atlas Valve Co., Newark, N. J.
Clark Mfg. Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eddington Metal Specialty Co., Eddington, Pa.
Edward Valves, Inc., East Chicago, Ind.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
OPW-Jordan, Cincinnati, O.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Ross Valve & Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Simplex Valve & Meter Co., Lancaster, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Tryco Products, Inc., Westfield, Mass.
Warren Engineering Co., Broadway, N. J.
Watkins Co., J. E., Maywood, Ill.

VALVES, PRESSURE REDUCING AND REGULATING, STEAM

Aerco Corp., Northvale, N. J.
Airmatic Valve Inc., Cleveland, O.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
OPW-Jordan, Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Conneaut, O.
Swiss Colony Engineering Co., Monroe, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.

VALVES, PUMP

Anchor Packing Co., Philadelphia, Pa.
Atlas Valve Co., Newark, N. J.
Burrows Mfg. Co., F. A., York, Pa.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill.
Coffin Co., Jr., J. S., Englewood, N. J.
Combination Pump Valve Co., Philadelphia, Pa.
Darcoid Co., Inc., New York, N. Y.
Defender Instrument & Regulator Co., Boody, Ill.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Garlock Packing Co., Palmyra, N. Y.
Goodrich Industrial Products Co., Akron, O.
Hill Pump Valve Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Madden Corp., The, Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
New York Belting & Packing Co., Passaic, N. J.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Company, New York, N. Y.
Valves, Inc., F. G., Milwaukee, Wis.
Watts Regulator Co., Lawrence, Mass.
Webster Electric Co., Racine, Wis.
White Flomatic Div., Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, QUICK OPENING

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Flow Control Corp., Houston, Tex.
Anderson Brass Co., Detroit, Mich.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Barksdale Valves, Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Darling Valve Mfg. Co., Williamsport, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Dole Refrigerating Co., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Grinnell Co., Inc., Providence, R. I.
Hamer Valves Inc., Long Beach, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hammond Valve Corp., Hammond, Ind.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jamesbury Corp., Worcester, Mass.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Cudahy, Wis.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Semet-Solvay Engineering Div., Allied Chemical Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, RADIATOR, AIR, FOR HOT WATER RADIATORS

American-Standard Detroit Controls Div., Detroit, Mich.
Anderson Products, Inc., Newtonville, Mass.
Beacon Brass Co., Waltham, Mass.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

Dole Valve Co., The, Morton Grove, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Valve Corp., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Little Brass Goods Co., M. S., Hartford, Conn.
Maid-O'Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Quality Specialty Co., Inc., Camden, N. J.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.

VALVES, RADIATOR, AIR, FOR STEAM RADIATORS

American-Standard Detroit Controls Div., Detroit, Mich.
Anderson Products, Inc., Newtonville, Mass.
Beacon Brass Co., Waltham, Mass.
Bridgeport Brass Co., Bridgeport, Conn.
Dole Valve Co., The, Morton Grove, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gorton Heating Co., Cranford, N. J.
Hammond Valve Corp., Hammond, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkin Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, ELECTRIC

Barber-Colman Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Jenkins Bros., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Controls, Inc., Newton, Mass.
Sarcotherm Controls Inc., New York, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PACKLESS

Barber-Colman Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PNEUMATIC

Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED

American-Standard Detroit Controls Div., Detroit, Mich.
Barber-Colman Co., Rockford, Ill.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Heat Timer Corp., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
OPW-Jordan, Cincinnati, O.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, LaCrosse, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED, PACKLESS

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, ORIFICE

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Jenkins Bros., New York, N. Y.
Marsh Valve Co., Dunkirk, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Trane Co., The, LaCrosse, Wis.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND

American-Standard Detroit Controls Div., Detroit, Mich.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fairbanks Co., The, New York, N. Y.
Hammond Valve Corp., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Products, American Air Filter Co., Inc., Louisville, Ky.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kritzer Radiant Coils, Inc., Batavia, Ill.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING

Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ohio Brass Co., Mansfield, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Inc., Milwaukee, Wis.
Webster & Co., Warren, Camden, N. Y.

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Automatic Switch Co., Florham Park, N. J.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Frick Co., Waynesboro, Pa.
General-American Valve Co., Corona Del Mar, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Lunkenheimer Co., Cincinnati, O.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
Metrex Valve Co., Franklin Park, Ill.
Mueller Brass Co., Port Huron, Mich.
Okadee Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, BACK PRESSURE

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hubbell Corp., Mundelein, Ill.
Metrex Valve Co., Franklin Park, Ill.
Mueller Brass Co., Port Huron, Mich.
OPW-Jordan, Cincinnati, O.
Refrigerating Specialties Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
Cash Co., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Metrex Valve Co., Franklin Park, Ill.

Refrigerating Specialties Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
York Corp., Subsid. of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Metrex Valve Co., Franklin Park, Ill.
Sporlan Valve Co., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Subsid. of Borg-Warner Corp.. York, Pa.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE

Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Armstrong Machine Works, Three Rivers, Mich.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Frick Co., Waynesboro, Pa.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Metrex Valve Co., Franklin Park, Ill.
Phillips & Co., H. A., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE AND LOW PRESSURE

Alco Valve Co., St. Louis, Mo.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED

Alco Valve Co., St. Louis, Mo.
Defender Instrument & Regulator Co., Boody, Ill.
Frick Co., Waynesboro, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Metrex Valve Co., Franklin Park, Ill.
Phillips & Co., H. A., Chicago, Ill.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, MAGNETIC STOP

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American-Standard Detroit Controls Div., Detroit, Mich.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hubbell Corp., Mundelein, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Metrex Valve Co., Franklin Park, Ill.
Penn Controls, Inc., Goshen, Ind.
Refrigerating Specialties Co., Chicago, Ill.
Sporlan Valve Co., St. Louis, Mo.
Watkins Co., J. E., Maywood, Ill.

VALVES, REFRIGERATION, TEMPERATURE REGULATING OR SNAP ACTION SUCTION

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Hubbell Corp., Mundelein, Ill.
McCorkle Co., D. H., Berkeley, Calif.
Metrex Valve Co., Franklin Park, Ill.
OPW-Jordan, Cincinnati, O.
Refrigerating Specialties Co., Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.

VALVES, REFRIGERATION, WATER REGULATING, PRESSURE OR TEMPERATURE ACTUATED

A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Art Valve Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chatleff Valve & Mfg. Co., Austin, Tex.
Circle Seal Products Co., Inc., Pasadena, Calif.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kieley & Mueller, Inc., Middletown, N. Y.
Mercoid Corp., Chicago, Ill.
Metrex Valve Co., Franklin Park, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Spence Engineering Co., Inc., Walden, N. Y.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, RELIEF, HOT WATER, COMBINED PRESSURE AND TEMPERATURE OPERATED

Beacon Brass Co., Waltham, Mass.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Kunkle Valve Co., Ft. Wayne, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Patrol Valve Co., The, Cleveland, O.
Sall Bros. Co., Rockford, Ill.
Schaible Co., The, Mariemont, O.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Durabla Mfg. Co., New York, N. Y.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Mueller Co., Decatur, Ill.
Multiplex Mfg. Co., Berwick, Pa.
OPW-Jordan, Cincinnati, O.
Patrol Valve Co., The, Cleveland, O.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Taco Heaters, Inc., Cranston, R. I.
Texsteam Corp., Houston, Tex.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED, SELF-FILLING

Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Mueller Co., Decatur, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

VALVES, RELIEF, HYDRAULIC

Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Blackhawk Mfg. Co., Milwaukee, Wis.
Cameron Iron Works, Inc., Houston, Tex.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena. Calif.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Greer Hydraulics, Inc., Jamaica, N. Y.
Hydronic Co., The, Detroit, Mich.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Keckley Co., O. C., Skokie, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.

Pantex Mfg. Corp., Hydraulic Div., Pawtucket, R. I.
Republic Mfg. Co., Inc., Cleveland, O.
Ross Valve Mfg. Co., Troy, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Trane Co., The, La Crosse, Wis.
Tryco Products, Inc., Westfield, Mass.
Tuthill Pump Co., Chicago, Ill.
Webster Electric Co., Racine, Wis.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.
Wilson Co., K. R., Arcade, N. Y.

VALVES, RELIEF, OIL

American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Associated Valve Co., North Wales, Pa.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Davis Regulator Corp., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hauck Mfg. Co., Brooklyn, N. Y.
Hubbell Corp., Mundelein, Ill.
Keckley Co., O. C., Skokie, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Locke Regulator Co., Salem, Mass.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Co., Decatur, Ill.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Preferred Utilities Mfg. Corp., New York.
Reliable Products Mfg. Co., Inc., Brooklyn, N. Y.
Republic Mfg. Co., Cleveland, O.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Staples & Pfeiffer, San Francisco, Calif.
Texsteam Corp., Houston, Tex.
Tuthill Pump Co., Chicago, Ill.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster Electric Co., Racine, Wis.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, SADDLE

Anderson Metals Corp., Kansas City, Mo.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Fairbanks Co., The, New York, N. Y.
Imperial Brass Mfg. Co., Chicago, Ill.
Madden Brass Products Co., Aurora, Ill.
Maid-O'Mist, Inc., Chicago, Ill.
Walworth Co., New York, N. Y.

VALVES, SAFETY CLEANOUT

Edward Valves, Inc., East Chicago, Ind.
Petrometer Corp., Long Island City, N. Y.

VALVES, SAFETY, STEAM

American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Associated Valve Co., North Wales, Pa.
Automatic Switch Co., Florham Park, N. J.
Crane Co., Chicago, Ill.
Crosby Valve & Gage Co., Wrentham, Mass.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Div., General Controls Co., Warwick, R. I.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
New York Air Valve Corp., Brooklyn, N. Y.
Patrol Valve Co., The, Cleveland, O.
Powell Co., Wm., The, Cincinnati, O.
Rockwood Sprinkler Co., Worcester, Mass.
Scott Valve Mfg. Co., Detroit, Mich.
Texsteam Corp., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.

VALVES, SAMPLING

Alloy Steel Products Co., Linden, N. J. (stainless steel)
American-Standard Detroit Controls Div., Detroit, Mich.
Cooper Alloy Corp., Hillside, N. J.
Dahl Co., Inc., G. W., Bristol, R. I.
Duriron Co., Inc., The, Dayton, O.
Edward Valves, Inc., East Chicago, Ind.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jamesbury Corp., Worcester, Mass.
OPW-Jordan, Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Powell Co., William, Cincinnati, O.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Div., of Stockham Valves & Fittings, Birmingham, Ala.

VALVES, SLIDE

Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Jenkins Bros., New York, N. Y.
OPW-Jordan, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Walworth Co., New York, N. Y.
Webster Electric Co., Racine, Wis.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, SOLDER JOINT

American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Kinsman, O.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Fairbanks Co., The, New York, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammond Valve Corp., Hammond, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Marsh Valve Co., Dunkirk, N. Y.
Mueller Brass Co., Port Huron, Mich.
Nibco, Inc., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y. (Silver brazed)

VALVES, SOLENOID

A-P Controls Div., Controls Co. of America, Milwaukee, Wis
Airmatic Valve, Inc., Cleveland, O.
Alco Valves Co., St. Louis, Mo.
Allied Control Co., Inc., New York, N. Y.
American-Standard Detroit Controls Div., Detroit, Mich.
Associated Valve Co., North Wales, Pa.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Barksdale Valves, Los Angeles, Calif.
Baso, Inc., Milwaukee, Wis.
Chatleff Valve & Mfg. Co., Austin, Tex.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Clayton Mark & Co., Evanston, Ill.
Davis Regulator Co., Chicago, Ill.
Dole **Valve Co., The, Morton Grove,** Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electronics Corp. of America, Cambridge, Mass.
Erickson Specialty Co., Cohoes, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Gould Co., J. D., Indianapolis, Ind.
Grove Valve and Regulator Co., Oakland, Calif.
Hanna Engineering Wks., Chicago, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hubbell Corp., Mundelein, Ill.
Hunt Valve Co., Salem, O.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Keckley Co., O. C., Skokie, Ill.
Lammert & Mann Co., Chicago, Ill. (Gas safety shut-off)
Ledeen Mfg. Co., El Monte, Calif.
Magnatrol Valve Corp., Hawthorne, N. J.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
North American Mfg. Co., Cleveland, O.
Penn Controls, Inc., Goshen, Ind.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Ranco Incorporated, Columbus, O.
Refrigerating Specialties Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., So. Pasadena, Calif.
Skinner Electric Valve Div., The Skinner **Chuck Co., New Britain, Conn.**
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Trerice Co., H. O., Detroit, Mich.
Valcor Engineering Corp., Kenilworth, N. J.
Vapor Heating Corp., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.
Webster Electric Co., Racine, Wis.
White-Rodgers Co., St. Louis, Mo.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, STEAM-JACKETED

Alco Products, Inc., Schenectady, N. Y.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Associated Valve Co., North Wales, Pa.
Darling Valve & Mfg. Co., Williamsport, Pa.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Everlasting Valve Co., Jersey City, N. J.

Gato Valve Co., Pittsburgh, Pa.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hetherington & Berner, Inc., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jamesbury Corp., Worcester, Mass.
Nuclear & Power Equipment Corp., S. San Francisco, Calif.
Parks-Cramer Co., Fitchburg, Mass.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Birmingham, Ala.

VALVES, SWITCHING, HEAT PUMP

Alco Valve Co., St. Louis, Mo.
Chatleff Valve & Mfg. Co., Austin, Tex.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Ranco Incorporated, Columbus, O.

VALVES, 2, 3 AND 4 WAY

Airmatic Valve, Inc., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
American-Standard Detroit Controls Div., Detroit, Mich.
Anderson Brass Co., Detroit, Mich.
Anderson Metals Corp., Kansas City, Mo.
Aqua Matic, Inc., Rockford, Ill.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Florham Park, N. J.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Barworth, Inc., Springfield, N. J.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bordo Co., Inc., L. J., Glenside, Pa. (plug)
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chatleff Valve & Mfg. Co., Austin, Tex.
Chemtrol, Lynwood, Calif. (plastic)
Circle Seal Products Co., Inc., Pasadena, Calif.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl Co., Inc., G. W., Bristol, R. I.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Davis Regulator Co., Chicago, Ill.
De Zurik Corp., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gardner-Denver Co., Quincy, Ill.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Div., General Controls Co., Warwick, R. I.
Hanna Engineering Wks., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Holby Tempering Valve Co., Inc., New York, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt Valve Co., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ladish Co., Cudahy, Wis.
Ledeen Mfg. Co., El Monte, Calif.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Brass Co., Port Huron, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, O.
Penn Controls, Inc., Goshen, Ind.
Permutit Co., Div. of Pfaudler Permutit, Inc., New York, N. Y.
Powell Co., Wm., Cincinnati, O.
Product Engineering, Oak Lawn, Ill.
Ranco Incorporated, Columbus, O.
Refrigerating Specialties Co., Chicago, Ill.
Republic Mfg. Co., Cleveland, O.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Seamon Snap Valve Co., Westboro, Mass.
Semet-Solvay Engineering Div., Allied Chemicals Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Valcor Engineering Corp., Kenilworth, N. J.
Wach Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y. (Lubricated plug valves)
Warren Engineering Co., Broadway, N. J.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Webster Electric Co., Racine, Wis.
Whittaker Controls, A Div. of Telecomputing Corp., Los Angeles, Calif.

VALVES, WATER GAGE

Associated Valve Co., North Wales, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Ernst Water Column & Gauge Co., Livingston, N. J.
Henry Valve Co., Melrose Park, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.

VANES, DUCT TURNING, PREFABRICATED

Anemostat Corp. of America, New York, N. Y. (Equalizing deflectors)
Barber-Colman Co., Rockford, Ill.
Cain Mfg. Inc., Birmingham, Ala.
Duro-Dyne Corp., Farmingdale, L. I., N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United Sheet Metal Co., Inc., Columbus, O.
Waterloo Register Co., Inc., Waterloo, Ia.

VAPOR BARRIERS

See Barriers, Vapor

VAPOR HEATING SYSTEMS

See Systems, Heating, Vapor

VAPORIZERS FOR PROPANE-BUTANE

Buxton Mfg. Co., Dover, N. J.
Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Mitchell Co., John E., Dallas, Tex.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
Ransome Torch & Burner Co., Emeryville, Calif.

VARIABLE SPEED DRIVES

See Changers, Speed, Hydraulic Coupling; Changers Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

VARIABLE SPEED PULLEYS

See Changers, Speed, Mechanical

V-BELT DRIVES

See Drives, V-Belt

VELOCITY, REGULATORS

See Regulators, Air Velocity

VENT FLUE CAPS

See Caps, Vent Flue

VENTILATING HOSE

See Ducts and Duct Fittings, Prefabicated, Flexible and Non-Flexible, Metallic and Non-Metallic; Hose, Flexible, Metal and Fittings

VENTILATION HEATERS

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit

VENTILATORS, MUSHROOM

Aladdin Heating Corp., San Leandro, Calif.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Chicago Blower Corp., Franklin Park, Ill.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Knight, Maurice A., Akron, O. (Stoneware)
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Muckle Mfg. Co., Owatonna, Minn.
Penn Ventilator Co., Philadelphia, Pa.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Robinson Clay Product Co., Akron, O.
United Sheet Metal Co., Inc., Columbus, O.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, ROOF, FAN

Acme Engineering & Mfg. Corp., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Conditioning Engineering Co., Cambridge, Mass.
Airjet Ventilator Co., San Clemente, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Coolair Corp., Jacksonville, Fla.
American-Standard Industrial Div., Detroit, Mich.
Ammerman Co., Inc., Stillwater, Minn.
Arden Airoflo Engineering, Inc., El Monte, Calif.
Arex Co., Chicago, Ill.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Bertram Co., Harvey P., The, Cincinnati, O.
Bowman Steel Corp., Pittsburgh, Pa.
Breidert Co., G. C., San Fernando, Calif.
Buffalo Forge Co., Buffalo, N. Y.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Clay Equipment Corp., Cedar Falls, Ia.
Colt Ventilation of America, Inc., Los Angeles, Calif.
Commercialaire Corp. of America, Brooklyn, N. Y.
Consolidated General Products, Inc., Houston, Tex.
Cook Co., Loren, Berea, O.
Dana Fan & Blower Corp., Cincinnati, O.
Davidson Hyduty Roof Fan Co., Newton, Mass.
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Donaldson Power Ventilator Co., Los Angeles, Calif.
Dryer Electric Corp., Fan Div., Brooklyn, N. Y.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gallaher Co., The, Omaha, Neb.
Genie-Air, Los Angeles, Calif.
Greenheck Fan & Ventilator Corp., Schofield, Wis.

Hamilton Fan & Blower Co., Inc., Cincinnati.
Hartzell Propeller Fan Co., Piqua, O.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Hudson Mfg. Co., H. D., Chicago, Ill.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Iron Lung Ventilator Co., Cleveland, O.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
King Co. of Owatonna, The, Owatonna, Minn.
Kody Blower Co., Trenton, N. J.
Lennox Industries Inc., Des Moines, Ia.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Midwest Airmoving Corp., Willoughby, O.
Moore Co., The, Marceline, Mo.
Mountain States Equipment Co., Denver, Colo.
Muckle Mfg. Co., Owatonna, Minn.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Penn Ventilator Co., Philadelphia, Pa.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., Plainfield, N. J.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Robertson Co., H. H., Pittsburgh, Pa.
Romla Co., Los Angeles, Calif.
Sargent Enginairing Co., Cleveland, O.
South Bend Air Products, Inc., South Bend, Ind.
Structa-Lung Co., The, Willoughby, O.
Swartwout Fabricators, Inc., Kokomo, Ind.
Trane Co., The, La Crosse, Wis. (available with heating coils)
Triangle Engineering Co., Houston, Tex.
Truflo Fan Co., Harmony, Pa.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Waverly Heating Supply Co., Beverly, Mass.
Western Engineering & Mfg. Co., Los Angeles, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.

VENTILATORS, ROOF, GRAVITY

Accurate Sheet Metal & Mfg. Works, Inc., Chicago, Ill.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Airjet Ventilator Co., San Clemente, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans.
Ammerman Co., Inc., Stillwater, Minn.
Arex Co., Chicago, Ill.
Bowman Steel Corp., Pittsburgh, Pa.
Breidert Co., G. C., San Fernando, Calif.
Brisk Metal Products, Ridgefield, N. J.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., Inc., Stamford, Conn.
Chicago Ventilator Co., Chicago, Ill.
Clay Equipment Corp., Cedar Falls, Ia.
Colt Ventilation of America, Inc., Los Angeles, Calif.
Cook Co., Loren, Berea, O.
Donaldson Power Ventilator Co., Los Angeles, Calif.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Exit-Aire Co., Pacoima, Calif.
Greenheck Fan & Ventilator Corp., Schofield, Wis.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Hudson Mfg. Co., H. D., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
International Metal Products, Phoenix, Ariz.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Industries Inc., Des Moines, Ia.
Leslie Welding Co., Inc., Chicago, Ill.
Levow, Inc., David, South Hackensack, N. J.
Maple City Furnace Co., Monmouth, Ill.
Moeschl-Edwards Corrugating Co., Inc., The, Cincinnati, O.
Octagon Ventilator Co., Chicago, Ill.
Penn Ventilator Co., Philadelphia, Pa.
Plasteel Products Corp., Washington, Pa.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Robertson Co., H. H., Pittsburgh, Pa.
Romla Co., Los Angeles, Calif.
St. Paul Corrugating Co., St. Paul, Minn.
Souther Iron Co., E. E., St. Louis, Mo.
Swartwout Fabricators, Inc., Kokomo, Ind.
Tierney Rotor Ventilator Co., Minneapolis.
Triangle Engineering Co., Houston, Tex.
United Sheet Metal Co., Inc., Columbus, O.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Walker Jamar Co., Duluth, Minn.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Warner Ventilator Co., La Grange, Ind.
Waverly Heating Supply Co., Beverly, Mass.
Western Engineering & Mfg. Co., Los Angeles, Calif.

VENTILATORS, ROOF, WITH FUSIBLE LINKS, FOR VENTING PRODUCTS OF COMBUSTION

Airjet Ventilator Co., San Clemente, Calif.
American Metal Works, Inc., New Orleans.
Bertram Co., The Harvey P., Cincinnati, O.
Burt Mfg. Co., Akron, O.
Chicago Blower Corp., Franklin Park, Ill.
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
De Bothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kody Blower Co., Trenton, N. J.
Mahon Co., R. C., The, Detroit, Mich.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Reynolds Ventilator Mfg. Corp., Chicago, Ill.
Robertson Co., H. H., Pittsburgh, Pa.
Swartwout Fabricators, Inc., Kokomo, Ind.
Triangle Engineering Co., Houston, Tex.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, UNIT, ELECTRIC HEATING ELEMENT

Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Nesbitt, Inc., John J., Philadelphia, Pa.
Vulcan Radiator Co., Hartford, Conn.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.

VENTILATORS, UNIT, GAS

Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Norman Products Co., Inc., Columbus, O.
Tuck-Aire Furnace Co., San Francisco, Calif.

VENTILATORS, UNIT, HOT WATER AND STEAM

Blazer & Son, M., Passaic, N. J.
Gannon Co., Russell R., Cincinnati, O.
Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Kody Blower Co., Trenton, N. J.
Nesbitt, Inc., John J., Philadelphia, Pa.
Rittling Corp., The, Buffalo, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Trane Co., The, LaCrosse, Wis.
Valveblower Co. of Calif., Santa Fe Springs, Calif.
Vulcan Radiator Co., Hartford, Conn.
Wood Mfg. Co., A. R., Luverne, Minn.

VENTILATORS, WALL, FAN

Air Control Products, Inc., Coopersville, Mich.
American Coolair Corp., Jacksonville, Fla.
American-Standard Industrial Div., Detroit.
Ammerman Co., Inc., Stillwater, Minn.
Barnebey-Cheney Co., Columbus, O. (with activated charcoal)
Bertram Co., Harvey P., The, Cincinnati, O.
Buffalo Forge Co., Buffalo, N. Y.
Cincinnati Fan & Ventilating Co., Cincinnati, O.
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
Commercialaire Corp. of America, Brooklyn, N. Y.
Consolidated General Products, Inc., Houston, Tex.
Cook Co., Loren, Berea, O.
DeBothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Emerson Electric Mfg. Co., St. Louis, Mo.
Exit-Aire Co., Pacoima, Calif.
Gallaher Co., The, Omaha, Nebr.
Hudson Mfg. Co., H. D., Chicago, Ill.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kody Blower Co., Trenton, N. J.
Lennox Industries Inc., Des Moines, Ia.
Martin Fan & Blower Co., Chicago, Ill.
NuTone, Inc., Cincinnati, O.
Phelps Mfg. Co., Little Rock, Ark.
Power Line Fan Co., Inc., Subsid. of Chelsea Products, Inc., Plainfield, N. J.
Romla Co., Los Angeles, Calif.
Triangle Engineering Co., Houston, Tex.
Whirlwind Mfg. Co., Houston, Tex.

VENTS, RELIEF, AND INTAKE, AIR

Ammerman Co., Inc., Stillwater, Minn.
Bertram Co., The Harvey P., Cincinnati, O.
Carnes Corp., Verona, Wis.
Chicago Ventilator Co., Chicago, Ill.
Cook Co., Loren, Berea, O.
Exit-Aire Co., Pacoima, Calif.
Ilg Electric Ventilating Co., Chicago, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis.
Kody Blower Co., Trenton, N. J.
Leslie Welding Co., Inc., Chicago, Ill.
Muckle Mfg. Co., Owatonna, Minn.
Senrac Industries, Madison, Wis.
Somers Corp., Detroit, Mich.
Swartwout Fabricators, Inc., Kokomo, Ind.
Universal Valve Co., Elizabeth, N. J.
Waterloo Register Co., Waterloo, Ia.

VIBRATION DETECTORS

See Detectors, Vibration

VIBRATION ISOLATORS

See Absorbers, Vibration; Bases, Vibration Isolating, Pad Type; Bases, Vibration Isolating, Spring Type; Hose, Flexible, Metal and Fittings

VISCOSIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Bendix Aviation Corp., Cincinnati Div., Cincinnati, O.
Brabender Corp., Rochelle Park, N. J. (recording)
Bristol Co., The, Waterbury, Conn.
Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Drage Products, Inc., Union City, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Humboldt Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Thomas Co., Arthur H., Philadelphia, Pa.
Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Tipptronics, Inc., Chagrin Falls, O.
Will Corp., Rochester, N. Y.

VISES, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Columbian Vise & Mfg. Co., Cleveland, O.
Desmond-Stephan Mfg. Co., Urbana, O.
Erie Tool Wks., Erie, Pa.
Fine Products Co., Berwyn, Ill.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.

Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Vanderman Mfg. Co., Willimantic, Conn.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y.
Yost Mfg. Co., Cambridge Springs, Pa.

VISES, SHEET METAL WORKERS'

Columbian Vise & Mfg. Co., Cleveland, O.
Desmond-Stephan Mfg. Co., Urbana, O.
Milton Equipment Co., Philadelphia, Pa.
Yost Mfg. Co., Cambridge Springs, Pa.

VOLTMETERS

Columbia Electric Mfg Co., Cleveland, O.
Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
EPIC, Inc., New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Pyramid Instrument Corp., Lynbrook, Long Island, N. Y.
Sangamo Electric Co., Springfield, Ill.

WARM AIR FURNACES

See Furnaces, Warm Air

WASHERS, AIR

Air & Refrigeration Corp., New York, N. Y.
Air-Cooling Engineering Co., Evanston, Ill.
Airfan Engineering Co., Los Angeles, Calif.
Alton Mfg. Co., Dallas, Tex.
American-Standard Industrial Div., Detroit.
Automotive Rubber Co., Inc., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Century Engineering Corp., Cedar Rapids, Ia
Clarage Fan Co., Kalamazoo, Mich.
Comfort Products Inc., Dallas, Tex.
Continental Air Filters, Inc., Louisville, Ky.
DeVilbiss Co., The, Toledo, O.
DeVilbiss Metal Fabricators Co., Detroit, Mich.
Donaldson Power Ventilator Co., Los Angeles, Calif.
Drying Systems Co., Chicago, Ill.
Ducon Co., Inc., The, Mineola, N. Y.
Gaffers & Sattler, Los Angeles, Calif.
Johnson-March Corp., Philadelphia, Pa.
Mahon Co., R. C., The, Detroit, Mich.
Marlo Coil Co., St. Louis, Mo.
Master Fan Corp., Los Angeles, Calif.
Mountain States Equipment Co., Denver, Colo.
Parks-Cramer Co., Fitchburg, Mass.
Schmieg Industries Inc., Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Spray Engineering Co., Burlington, Mass.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Western Blower Co., Seattle, Wash.
York Corp., Subsidiary of Borg-Warner Corp., York, Pa.

WASHERS, FUME

Air Pollution Control Div., John Wood Co., Bernardsville, N. J.
Argo Plastic Products, Cleveland, O.
Automotive Rubber Co., Inc., Detroit, Mich.
Burdett Mfg. Co., Chicago, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Centri-Spray Corp., Livonia, Mich. (wet type)
Ducon Co., Inc., The, Mineola, N. Y.
DuVerre, Inc., Buffalo, N. Y. (plastic)
General Ceramics Corp., Keasbey, N. J (plastic & ceramic)
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Johnson-March Corp., Philadelphia, Pa.
Knight, Maurice A., Akron, Ohio (wet type)
Mahon Co., R. C., The, Detroit, Mich.
Master Fan Corp., Los Angeles, Calif.
Oxy Catalyst, Inc., Wayne, Pa.
Peabody Engineering Corp., New York, N. Y.
Schmieg Industries, Inc., Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.

WATER CHILLERS

See Chillers, Water, for Air Conditioning and Refrigeration, Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections, and Controls

WATER CONDITIONERS

See Conditioners, Water; Treatment, Water

WATER DISTRIBUTORS FOR CONDENSERS

See Distributors, Water, for Condensers

WATER HAMMER ELIMINATORS

See Absorbers, Shock, Liquid

WATER RAMS FOR CLEANING OUT PIPE LINES

See Rams, Water

WATER STERILIZER, ULTRAVIOLET

See Units, Sterilizing, Water

WATER TREATMENT

See Treatment, Water; Devices, Electrolytic, for Preventing Corrosion

WATTMETERS

Daystrom-Weston Sales Div., Daystrom Inc., Newark, N. J.
General Electric Co., Apparatus Sales Div , Schenectady, N. Y.
Sangamo Electric Co., Springfield, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELD TESTING MACHINES

See Machines, Testing, Weld

WELDERS, ARC

Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Borm Mfg. Co., Elgin, Ill.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Electric Arc, Inc., Newark, N. J.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Fern, Ralph, Scranton, Pa.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Hammett Electric Co., Kansas City, Kans.
Harnischfeger Corp., Milwaukee, Wis.
Hobart Bros. Co., Troy, O.
Lincoln Electric Co., Cleveland, O.
Linde Co., Div. of Union Carbide Corp., New York, N. Y. (Inert gas-shielded)
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., Rahway, N. J.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Peer, Inc., Benton Harbor, Mich.
Precision Welder Mfg. Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Trindl Products, Ltd., Chicago, Ill.
Tweco Products Inc., Wichita, Kan. (Cable connectors, electrode holders and accessories and welding cable)
United Specialties, Inc., El Dorado, Ark. (welding cable reel)
Welding Apparatus Co., Chicago, Ill.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Buffalo, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELDERS, FOR PLASTIC PIPE OR PLASTIC SHEET

American Agile Corp., Bedford, O.
Argo Plastic Products, Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass.
Laramy Products Co., Hingham, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (electric & acetylene types)
Seelye Craftsmen, Inc., Minneapolis, Minn.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles, Calif.
Acro Welder Mfg. Co., Milwaukee, Wis.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alphil Spot Welder Mfg. Corp., Brooklyn, N. Y.
Delta Welder Corp., Detroit, Mich.
Duro-Dyne Corp., Farmingdale, L. I., N. Y. (portable)
Eisler Engineering Co., Inc., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Fern, Ralph, Scranton, Pa.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Hammett Electric Co., Kansas City, Kans.
Linde Co., Div. of Union Carbide Corp., New York, N. Y. (Inert gas-shielded arc)
Mallory & Co., Inc., P. R., Indianapolis, Ind. (electrode holders)
Micro Products Co., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
Milton Equipment Co., Philadelphia, Pa.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Nielsen, Inc., E. V., Stamford, Conn.
Peer, Inc., Benton Harbor, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Rex Welder Co., Kansas City, Mo.
Sciaky Bros., Inc., Chicago, Ill.
Taylor-Winfield Corp., Warren, O.
Thomspon Electric Welder Co., Lynn, Mass.
Universal Welder Corp., Cleveland, O.
Weldex, Inc., Detroit, Mich.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELDERS, STUD

Eisler Engineering Co., Inc., Newark, N. J.
Gregory Industries, Inc., Nelson Stud Welding Div., Lorain, O.
Hammett Electric Co., Kansas City, Kans.
Hobart Bros. Co., Troy, O.
KSM Products, Inc., Merchantville, N. J.
Omark Industries, Inc., Portland, Ore.

WELDING AND CUTTING APPARATUS, OXY-ACETYLENE

Air Products, Inc., Allentown, Pa.
Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Arcos Corp., Philadelphia, Pa. (arc-oxygen)
Atlas Welding Accessories Inc., Ferndale, Mich. (Weld cleaning tools)
Dockson Corp., Detroit, Mich.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Evans Machine Co., Inc., Baltimore, Md.
General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
Goss Gas, Inc., Glenshaw, Pa.
Harris Calorific Co., The, Cleveland, O.
K-G Equipment Co., Allentown, Pa.
Lenco, Inc., Jackson, Mo.
Linde Co., Div of Union Carbide Corp., New York, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O. (portable and stationary acetylene generators)
Smith Welding Equipment Corp., Minneapolis, Minn.
Steffan Mfg. Corp., Salem, O.
United Specialties, Inc., El Dorado, Ark (welding hose reel)
Vernon Tool Co., Ltd., Alhambra, Calif.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.

WELDING COMPOUNDS

See Compounds, Welding

WELDING FUME COLLECTORS

See Exhausters, Welding Fume

WELDING RINGS

See Rings, Backing, for Pipe Welding

WELLS, THERMOMETER

Airserco Mfg. Co., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Campbell Co., J. A., Long Beach, Calif.
Corning Glass Works, Corning, N. Y.
Dickson Co., The, Chicago, Ill.
Engelhard Industries, Inc., Instruments & Systems Div., East Newark, N. J.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Keasbey, N. J. (graphite)
H-B Instrument Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Pacific Transducer Corp., Los Angeles, Calif.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Trerice Co., H. O., Detroit, Mich.
Weksler Instruments Corp., Freeport, L. I., N. Y.

WHEELS, BLOWER

Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airfan Engineering Co., Los Angeles, Calif.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Burden Div., Torrington Mfg. Co., Los Angeles, Calif.
Carolina Blower Co., Inc., Greensboro, N. C.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Denbo Engineering & Sales Co., Inc., Indianapolis, Ind. (molded plastics)
Gaffers & Sattler, Los Angeles, Calif.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Subsid. Ilg Electric Ventilating Co., Morton Grove, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jan-Air, Inc., Richmond, Ill.
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Mayne Products Co., Dayton, O.
Moore Co., The, Marceline, Mo.
Morrison Products, Inc., Cleveland, O.
New York Blower Co., Chicago, Ill.
Porter Co., Inc., H. K., Peerless Electric Div., Warren, O.
Power Engineering Corp., Mingo Jct., O.
R & R Metal Products, Inc., Chicago, Ill.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., Middletown, Conn.
Torrington Mfg. Co., Torrington, Conn.
United States Air Conditioning Corp., Delaware, O.
Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

WHISTLES AND HORNS, STEAM AND AIR

Leslie Co., Lyndhurst, N. J.
Powell Co., Wm., The, Cincinnati, O.
Wheelock Signals, Inc., Long Branch, N. J.

WHITE PRINT MACHINES

See Machines, Blue Print and White Print

WINDOW PANELS FOR AIR CONDITIONERS

See Panels, Window, for Air Conditioners

WINDOW VENTILATOR AND FILTER UNITS

See Units, Window Ventilator and Filter

WINDOWS, HEAT INSULATING

Anderson Corp., Bayport, Minn.
Chamberlin Co. of America, Detroit, Mich.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mississippi Glass Co., St. Louis, Mo.
Pam Co., The, Portland, Ore. (skylight)
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Russell Co., F. C., The, Columbiana, O.
Southern Plastics Co., Columbia, S. C.

WIRE, ELECTRIC, NUMBERED, FOR CONTROL SYSTEMS

Chester Cable Corp., Chester, N. Y.
Electric Autolite Co., Toledo, O.
Essex Wire Corp., Ft. Wayne, Ind.
Gavitt Wire & Cable Co., Div. of Amerace Corp., Brookfield, Mass.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Midwest Air Conditioning Co., Des Moines.
Midwest Automatic Control Co., Des Moines, Ia.
Moore & Co., Samuel, Mantua, O. (also for instrumentation)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.

WIRE, INSTRUMENT

Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
Foxboro Co., Foxboro, Mass.
Gavitt Wire & Cable Co., Div. of Amerace Corp., Brookfield, Mass.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Thermo Electric Co., Inc., Saddle Brook, N. J.

WIRE, OIL BURNER IGNITION

Chester Cable Corp., Chester, N. Y.
Dielectric Products Co., Inc., Jersey City, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
Packard Electric Div., General Motors Corp., Warren, O.
Phelps Dodge Copper Products Corp., New York, N. Y.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE

Airserco Mfg. Co., Pittsburgh, Pa.
Cornish-Wire Co., Inc., Williamstown, Mass. (flexible and fixture wire cordsets)
Dielectric Products Co., Inc., Jersey City, N. J.
Electric Autolite Co., Toledo, O.
Essex Wire Corp., Ft. Wayne, Ind.
Gavitt Wire & Cable Co., Div. of Amerace Corp., Brookfield, Mass.
General Electric Co., Construction Materials Sales Operation, Bridgeport, Conn.
Hammett Electric Co., Kansas City, Kans.
Kulka Electric Corp., Mt. Vernon, N. Y.
Packard Electric Div., General Motors Corp., Warren, O.

WRAP, PIPE

Canvas Products Co., St. Louis, Mo.
Johns-Manville, New York, N. Y.
Minnesota Mining & Mfg. Co., St. Paul.
Mortell Co., J. W., Kankakee, Ill.
Rhopac, Inc., Skokie, Ill.
Tapecoat Co., The, Evanston, Ill. (cool tar protective coating in tape form for pipe, pipe joints, pipe fittings, insulated pipe underground and above ground.)
Zippertubing Co., The, Los Angeles, Calif.

WRENCHES, AIR OPERATED

Albertson & Co., Inc., Sioux City, Ia. (impact)
Black & Decker Mfg. Co., The, Towson, Md.
Chicago Pneumatic Tool Co., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Skil Corp., Chicago, Ill.
Thor Power Tool Co., Aurora, Ill.

WRENCHES, CHAIN, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Williams Co., J. H., Buffalo, N. Y.

WRENCHES, ELECTRICALLY OPERATED

Albertson & Co., Inc., Sioux City, Ia. (impact)
Black & Decker Mfg. Co., The, Towson, Md.
Chicago Pneumatic Tool Co., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Skil Corp., Chicago, Ill.
Thor Power Tool Co., Aurora, Ill.

WRENCHES, PIPE

American Machine Wks., Inc., Racine, Wis.
Ampco Metal, Inc., Milwaukee, Wis.
Armstrong-Bridgeport Tool Mfg. Corp., Belleville, N. J.
Armstrong Bros. Tool Co., Chicago, Ill.
Basford Co., H. R., San Francisco, Calif.
Billings & Spencer Co., Hartford, Conn.
Bonney Forge & Tool Works, Allentown, Pa.
Crescent Tool Co., Jamestown, N. Y.
Duro Metal Products Co., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Nielsen, Inc., E. V., Stamford, Conn.
Nye Tool Co., Chicago, Ill.
Peck, Stow & Wilcox Co., Southington, Conn.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Sac Tool Co., St. Louis, Mo.
Schick Products, Inc., Belmont, Calif.
St. Piere Chain Corp., Worcester, Mass.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Tedd Company, The, Rockford, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.
Wheeler Mfg. Co., The, Ashtabula, O. (sliding jaw and self adjusting)

WRENCHES, PIPE, REPLACEABLE JAW

Ampco Metal, Inc., Milwaukee, Wis.
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Crescent Tool Co., Jamestown, N. Y.
Erie Tool Wks., Erie, Pa.
Lurie & Lurie, Chicago, Ill.
Nye Tool Co., Chicago, Ill.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, RATCHET

Ampco Metal, Inc., Milwaukee, Wis.
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Bonney Forge & Tool Works, Allentown, Pa.
Custanite Corp., Brooklyn, N. Y.
Duro Metal Products Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Greene, Tweed & Co., North Wales, Pa.
Kent-Moore Organization, Inc., Warren, Mich.
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Wiedeke Co., The Gustav, Dayton, O.
Williams & Co., J. H., Buffalo, N. Y.

WRENCHES, TORQUE INDICATING

Ammco Tools, Inc., North Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
Fairmount Tool & Forging, Inc., Cleveland, O.
Ingersoll-Rand Co., New York, N. Y. (for torque control)
JO-Line Tools, Inc., South Gate, Calif.
Kent-Moore Organization, Inc., Warren, Mich.
Portable Electric Tools, Inc., Chicago, Ill.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., Los Angeles, Calif.
Richmont, Inc., Monrovia, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Sturtevant Co., P. A., Addison, Ill.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.
X-4 Corp., West Acton, Mass. (geared head)

X-RAY MACHINES AND FILM

See Machines and Film, X-Ray

ZONE CONTROLS

See Systems, Heating, Zone Control

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS
PART 3—ALL TRADE NAMES

A-3—Cleaning compounds. Airkem, Inc., New York, N. Y.
A-B—Motor controllers, pilot lights, regulators, relays, solenoids, switches. Allen-Bradley Co., Milwaukee, Wis.
ABC—Dehumidifiers, humidifiers, dust collectors, American-Standard Industrial Div., Detroit, Mich.
ABR-A-Saw—Cutters, tools. Collins Machinery Corp., Los Angeles, Calif.
A-C—Water treatment. Elgin Softener Corp., Elgin, Ill.
ACB—Coatings. Tropical Paint & Oil Co., Cleveland, O.
ADP—Air diffusers, grilles, registers. Air Distribution Products Co., Los Angeles, Calif.
AISI Automatic Smoke Sampler—Testers, smoke. Research Appliance Co., Allison Park, Pa.
A & R—Dehumidifiers. Air & Refrigeration Corp., New York, N. Y.
ARR 300#—Unions. Jefferson Union Co., Lexington, Mass.
ARRC—Couplings, fittings, flanges, unions. Union Metal Wks. Co., Inc., Chelsea, Mass.
ASME—Regulators. Bell & Gossett Co., Morton Grove, Ill.
Abrasoweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Abso-Dry—Refrigerant dehydrators. Henry Valve Co., Melrose Park, Ill.
Absolute—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Accurex—Pipe gages. Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Ace—Dampers. Marsto Machine Co., West Quincy, Mass.
Ace—Fittings, pipe, protective coatings, pumps, tanks, valves. American Hard Rubber Co., Div. Amerace Corp., Butler, N. J.
Ace-Flex—Plastic tubing. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Ace-Ite—Plastic pipe, fittings, valves. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Ace Riviclor—Fittings, pipe, valves. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Ace-Saran—Plastic tubing, fittings. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Ace Tempron—Fittings, pipe. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Ace-Vent—Valves. Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Acipco—Steel tubing. American Cast Iron Pipe Co., Birmingham, Ala.
Acolite—Enamels and lacquers. Acorn Refining Co., Cleveland, O.
Acoustilite—Insulation. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.
Acragage—Indicating gages. International Register Co., Chicago, Ill.
Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Adacast—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adamant—Furnace cement, refractories and refractory cement. Botfield Refractories Co., Philadelphia, Pa.
Adapatch—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adastic—Insulating cement, insulation. Botfield Refractories Co., Philadelphia, Pa.
ADHECO—Tape. Adhesive Tape Corp., Brooklyn, N. Y.
Adjusta-Flo—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
Adjusto-Deck—Racks. Haertel Co., Walter, Minneapolis, Minn.
Adjust-O-Feeder—Feeders, pumps, water treatment. B-I-F Industries, Proportioneers Div., Providence, R. I.
Adjust-O-Slide—Motor bases. American Pulley Co., The, Philadelphia, Pa.
Adsorbit—Air freshening compounds, adsorbers, filters. Barnebey-Cheney Co., Columbus, O.
Advance—Scaffolds. Beaver Advance Corp., Ellwood City, Pa.
Aerisweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Aero—Aftercoolers, heat exchangers. Niagara Blower Co., New York, N. Y.
Aero—Radiation, hangers or brackets. National-U. S. Radiator Corp., Johnstown, Pa.
Aerodyne—Fans, ventilators. Jeffrey Mfg. Co., Columbus, O.
Aerodyne—Collectors. Green Fuel Economizer Co., Inc., The, Beacon, N. Y.
Aerofuse—Air diffusers. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Aerolag—Insulation. Johns-Manville, New York, N.Y.
Aerolux—Unitary air conditioners. Johnson Co., S. T., Oakland, Calif.
Aeromaster—Propeller fans, blades. Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Aeromatic—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Aeromatic Exhauster—Ventilators. Octagon Ventilator Co., Chicago, Ill.
Aeropass—Condensers. Niagara Blower Co., New York, N. Y.
Aeropel—Ventilators. American-Standard Industrial Div., Detroit, Mich.
Aeroplane—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Aeroplex—Fans. Bayley Blower Co., Milwaukee, Wis.
Aeropull—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Aerosolve—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Aerospot—Fans. South Bend Air Products, Inc., South Bend, Ind.
Aerotech—Meters. United Electric Controls Corp., Watertown, Mass.
Aerotube—Insulation. Johns-Manville, New York, N.Y.
Aeroturn—Collectors. Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Aerovane—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Aerovane—Grilles, registers. Tuttle & Bailey Div. of Allied Thermal Corp., New Britain, Conn.
Aertite—Compounds. Johns-Manville, New York, N. Y.
Afco—Heaters, unitary air conditioners. American Furnace Co., St. Louis, Mo.
Affco—Louvers and shutters, dampers. American Foundry & Furnace Co., Bloomington, Ill.
Agastat—Electrical relays. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Agaswitch—Time switches. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Agilene—Fittings, fans, sheets, ducts and duct fittings, pipe, tubing, welders, valves. American Agile Corp., Bedford, O.
Agilide—Ducts and duct fittings, fans, sheets, pipe, welders, valves. American Agile Corp., Bedford, O.
Agitair—Air diffusers, frames for holding panel type air filters, air scoops, grilles, registers, filters, dampers, ventilators. Air Devices, Inc., New York.
AIM Brand—Angles, bars, beams, channels and tees; pipe hangers and supports; pipe storage racks; tank stands. Acme Steel Co., Chicago, Ill.
Airacoustic—Insulation. Johns-Manville, New York, N. Y.
Air-aid—Compounds. Lord & Clark Co., Inc., Boston, Mass.
Air Base—Diffusers. Kritzer Radiant Coils, Inc., Batavia, Ill.
Aircap—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Air Cell—Abestos insulation. Keasbey & Mattison Co., Ambler, Pa.
Aircell Board—Insulation, Sheets. Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Air Check—Boiler compounds. Refractory & Insulation Corp., New York, N.Y.
Airco—Arc welders, electrodes, weld testing, welding rod, solder, machines, torches, oxygen piping and regulating systems. Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., New York, N. Y.
Aircon—Condensers. McQuay, Inc., Minneapolis, Minn.
Air-Con—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Aircoustat—Absorbers. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Airditioner—Unitary air conditioners. Modine Mfg. Co., Racine, Wis.
Air Door—Air curtain doorways. New Castle Products. Inc., New Castle, Pa.
Airefiner—Water treatment. Oakite Products, Inc., New York, N. Y.
AIRefrigeration—Unitary air conditioners. Williamson Co., Cincinnati, O.
Aire-Rectifier—Coolers, unitary air conditioners. Lintern Corp., Painesville, O.
Airette—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Airex—Air washers, fans, unitary air conditioners, ventilators. Mountain States Equipment Co., Denver, Colo.
Airfeedrill—Electric and pneumatic drills. Gardner-Denver Co., Quincy, Ill.
Airflex—Couplings. Falk Corp., Milwaukee.
Air-flo—Louvers and shutters, dampers, regulators. Air Conditioning Products Co., Detroit, Mich.
Airfoil—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Airfoil—Registers, scoops, grilles, dampers, diffusers. Titus Mfg. Corp., Waterloo, Ia.
Air Guide—Vanes. Titus Mfg. Corp., Waterloo, Ia.
Air Guide—Radiation. Rempe Co., Chicago.
Airicidin—Cleaning compounds. Easton R. S. Corp., Brooklyn, N. Y.
Airistocrat—Fan blades. Torrington Mfg. Co., Torrington, Conn.
Airjet—Stacks and chimneys. General Products Co., Inc., Fredericksburg, Va.
Airjector-Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Air Kits—Blower wheels. New York Blower Co., Chicago, Ill.
Airline—Torches, welding and cutting apparatus. Smith Welding Equipment Corp.. Minneapolis, Minn.
Air Line—Motors. Brown-Brockmeyer Co. Inc., Dayton, O.
Airliner—Fan blades, and fans. Burden Co. Alan E., Los Angeles, Calif.
Airlouver—Louvers and shutters. Swartwou Fabricators, Inc., Kokomo, Ind.
Air Master—Diffusers, grilles, registers Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Airmaster—Dehumidifiers. Haertel Co., Walter, Minneapolis, Minn.
Air Mat-PC—Filters. American Air Filte Co., Inc., Louisville, Ky.
Airmat Arrester—Dust colectors. American Air Filter Co., Inc., Louisville, Ky.
Airmat Drifilter—Filters. Airgard Mfg. Co Chicago, Ill.
Air-Max—Dampers, diffusers, fans, unit heaters, ventilators. Gallaher Co., The, Omaha Neb.
Air Meter—Air velocity meters. Hastings Raydist, Inc., Hampton, Va.
Airmover—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Air Mover—Exhausters. Mine Safety Appliances Co., Pittsburgh, Pa.
Airmpeler—Fans, fan exhauster units, ventilalators. Ammerman Co., Inc., Stillwater Minn.
Airocool—Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airo-Flex—Registers. Auer Register Co., Cleveland, O.
Airoil—Oil burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Air-O-Matic—Unitary air conditioners. Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O.
Airotor—Blower wheels. Torrington Mfg. Co., Torrington, Conn.
Airovent—Gas Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airpak—Filters. Conoflow Corp., Subsidiary of Walworth Co., Philadelphia.
Airphlo—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Airphlo Vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Air Prover—Regulators. A-P Controls Div., Controls Co. of America, Milwaukee, Wis.
Air Rad—Radiation. Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Airsan—Filters. Air Filter Corp., Milwaukee.
Air-Scoop—Eliminators, air separators. Taco Heaters, Inc., Cranston, R. I.

Airstat—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Airswitch—Thermostats, regulators. Minneapolis-Honeywell Regulator Co., Minneapolis.

Airtrol—Air eliminators. Bell & Gossett Co., Morton Grove, Ill.

Airtron—Ducts and duct fittings, hose. Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.

Air-Tumbler—Dust collectors. Dust Suppression & Engineering Co., Lake Orion, Mich.

Air-Van—Ventilators, exhausters, fans. Gallaher Co., The, Omaha, Neb.

Airvector—Refrigerating condensers. Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.

Airwave—Propeller fans, ventilators. Romla Co., Los Angeles, Calif.

Air-X-it—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Airxpel—Traps. Wright-Austin Co., Detroit.

Airxpeler—Roof ventilators, dampers, fittings, hose, exhausters, fans, panels and doors, fan exhauster units, wall ventilators, vents, louvers and shutters, vent flue caps. Ammerman Co., Inc., Stillwater, Minn.

Ajusto-Spede—Speed changers. Allis Co., Louis, Milwaukee, Wis.

Akon—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Aktiv—Cleaning compounds. Turco Products, Inc., Los Angeles, Calif.

Alaka—Protective coatings, enamels and lacquers. **Alfred Hague & Co., Inc., Div. of Lacquer & Chemical Corp.,** Brooklyn, N. Y.

Alaskan—Fans, unitary air conditioners. National Engrg. & Mfg. Co., Sedalia, Mo.

Alathon—Plastics, powders and resins. du Pont de Nemours & Co., Inc., E. I., Polychemicals, Dept., Wilmington, Del.

Alchemik—Enamels and lacquers. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.

Alcoa—Angles, compounds, rods, dehydrators, exchangers, pipe, sheets, tanks, tubing. Aluminum Co. of America, Pittsburgh, Pa.

Alcorjac—Pipe covering protectors. Aljon Mfg. Co., Inc., Maspeth, N.Y.

Alcotwin—Exchangers. Alco Products, Inc., Schenectady, N. Y.

Alcuplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alexall—Industrial adhesive tape. Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.

Alfol—Insulation. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.

Algaecide—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Algaecide—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Algicide—Water treatment. North American Mogul Products Co., The, Cleveland, O.

Align E-Z—Pipe nipples. Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.

Aliron—Sheets, clad. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alkaline—Compounds. Turco Products, Inc., Los Angeles, Calif.

Alkasteem—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.

All-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.

Allen—Benders. Steel City Electric Co., Pittsburgh, Pa.

Allencote—Refractories and refractory cement. Allen Co., Robert G., Mechanicsville, N. Y.

Allenite—Soot destroyers. Allen Co., Robert G., Mechanicsville, N. Y.

Allflex—Flexible metal hose and fittings, flexible metal tubing. Allied Metal Hose Co., Long Island City, N. Y.

All-In-One—Regulators. Bell & Gossett Co., Morton Grove, Ill.

Allispede—Speed changers. Allis Co., Louis, Milwaukee, Wis.

All-Motor—Gear-motors. Falk Corp., Milwaukee, Wis.

Allmul—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Allprene—Gaskets. Chicago Gasket Co., Chicago, Ill.

Allspeed Selector—Mechanical changers. Worthington Corp., East Orange, N. J.

All-Tite Vane Runner—Vanes. Elgen Mfg. Corp., Long Island City, N. Y.

All-Weather Thinline—Unitary air conditioners. General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.

Alnifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alnor—Anemometers, indicator controllers, thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Alodine—Protective coatings. Amchem Products, Inc., Ambler, Pa.

Aloyco—Gages, valves. Alloy Steel Products Co., Linden, N. J.

Aloyglas—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.

Alpine—Unitary air conditioners. International Metal Products Co., Phoenix, Ariz.

Alsiplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alternarc—Arc welders. Electric Arc, Inc., Newark, N. J.

Alumalung—Roof ventilators. Iron Lung Ventilator Co., Cleveland, O.

Alumend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

Alumilux—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.

ALUMINIZED STEEL—Sheets, aluminum coated. Armco Steel Corp., Middletown, O.

Aluminum—Roof ventilators. Iron Lung Ventilator Co., Cleveland, O.

Aluminweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Alumnaweld—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.

A-Lum-O-Aire—Filters. Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.

Alundum—Cement, protective coatings, grinders and grinding wheels, refractories and refractory cement. Norton Co., Worcester, Mass.

AluTin—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

Amballoy—Sheets. Byers Co., A.M., Pittsburgh, Pa.

Amblerex #2—Insulating cement. Keasbey & Mattison Co., Ambler, Pa.

Amchem—Isotopes. American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.

Amco—Protective coatings, welding compounds, solder. American Solder & Flux Co., Philadelphia, Pa.

Amco—Humidifiers, nozzles, psychrometers. Grinnell Co., Inc., Providence, R.I.

Amco—Control Systems, humidifiers, hygrometers, indicators, meters, nozzles, unitary air conditioners, psychrometers, valves. American Moistening Co., Cleveland, N. C.

Am-Duct—Ducts and duct fittings. American Vitrified Products Co., Cleveland, O.

Amer-Clone—Collectors. American Air Filter Co., Inc., Louisville, Ky.

Amer-glas—Unit filters. American Air Filter Co., Inc., Louisville, Ky.

American—Recorders, manometers, regulators, thermometers, transmitters, wells. Manning, Maxwell & Moore, Inc., Stratford, Conn.

American—Meters. Buffalo Meter Co., Inc., Buffalo, N. Y.

American—Heater. Hotstream Heater Co., Cleveland, O.

American AC—Air filters. American Air Filter Co., Inc., Louisville, Ky.

American Hammered—Rings. Koppers Company, Inc., Metal Products Div., Baltimore.

American H/V—Unit Filters. American Air Filter Co., Inc., Louisville, Ky.

American MW—Air filters. American Air Filter Co., Inc., Louisville, Ky.

American-Microsen — Transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Amerigear—Couplings. Zurn Industries, Inc., Erie, Pa.

Amerjet—Collectors. American Air Filter Co., Inc., Louisville, Ky.

Amer-Kool—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Amer-Plate—Tank linings. Amercoat Corp., South Gate, Calif.

Amervent—Unit ventilators. Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.

Amesteam—Boilers. Ames Iron Works, Inc., Oswego, N. Y.

Aminco—Colorimeters, gage testers, indicator-controllers, indicators, pumps, recorders, regulators, recorder-controllers, relays, viscosimeters. American Instrument Co., Inc., Silver Spring, Md.

Ammonoduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.

Ampco—Masonry drills. Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.

Ampcoflex—Pipe fittings, fume disposal hoods, plastic valves, tanks, ducts and duct fittings, plastic pipe, plastic sheets. Atlas Mineral Products Co., Mertztown, Pa.

Ampcolite—Plastic pipe. Atlas Mineral Products Co., Mertztown, Pa.

Am-Pe-Co—Centrifugal fans. American Machine Products Co., Marshalltown, Ia.

Amp-Quartz—Heaters, electric heating panels, baseboard radiation. Ampere Industries, Newark, N.J.

Amprobe—Ammeters and voltmeters. Pyramid Instrument Corp., Lynbrook, Long Island, N.Y.

Amvent—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.

Anaconda—Angles, bars, beams, channels and tees, electrodes fittings, pipe, welding rod, sheets, tubing, valves. American Brass Co., Waterbury, Conn.

Anco—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Anco Scale Remover—Compounds, scale removal, treatment. Anderson Chemical Co., Inc., Macon, Ga.

Ancor—Floor and ceiling plates. Ackermann Mfg. Co., Subsid. of Wheeling Steel Corp., Wheeling, W. Va.

Andrite—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.

Anemotherm—Direct reading meters. Anemostat Corp. of America, New York, N. Y.

Ankorite—Packing. Anchor Packing Co., Philadelphia, Pa.

Anthratube—Boilers. Axeman-Anderson Co., Williamsport, Pa.

Anti-Capillary Compounds—Compounds. **Eutectic Welding Alloys Corp., Flushing,** N. Y.

Anti-Spatter—Welding compounds. Thompson and Co., Oakmont, Pa.

Anti-Spatter—Welding compounds. Kote Co., Inc., Sheboygan, Wis.

Apco—Turbine type pumps, systems. Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.

Apeco—Blueprint machines. American Photocopy Equipment Co., Chicago, Ill.

Apex—Analyzers, recorders, indicators. Uehling Instrument Co., Paterson, N. J.

Apexior—Coatings. Dampney Co., Boston.

Appco—Fume washers. Argo Plastic Products, Cleveland, O.

Aprilaire—Humidifiers. Research Products Corp., Madison, Wis.

Apsco—Switches, nozzles. April Showers Co., Inc., Washington, D. C.

Apthorp—Nozzles. Boston Machine Works, Inc., Lynn, Mass.

Aqua-Clear—Water treatment. Sudbury Laboratory, South Sudbury, Mass.

AquaCooler—Towers, cooling. The Marley Co., Kansas City, Mo.

Aqua-Cushion—Absorbers. Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.

Aqualene—Water treatment. Lester Laboratories, Inc., Atlanta, Ga.

Aqua-Line—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.

Aqua-Line—Radiation. York-Shipley, Inc., York, Pa

Aqua-Pure—Filters. Cuno Engineering Corp., Meriden, Conn.

Aqua-Saver—Cooling towers. Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.

Aquastat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Aqua-Tite—Seals. Schwitzer Corp., Indianapolis, Ind.

Aquatone—Treatment, compounds, steam and water. Ampion Corp., Long Island City, N. Y.

Aquatower—Cooling towers. Marley Co., The, Kansas City, Mo.

Aqulux—Water heaters. Johnson Co., S. T., Oakland, Calif.

Arcaloy—Electrodes. Alloy Rods Co., York, Pa.

Arc-Eng—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Arco—Radiation. American-Standard Plumbing and Heating Div., New York, N. Y.

Arcoflame—Burners. American-Standard Plumbing & Heating Div., New York, N. Y.

Arcoglas—Heaters. American-Standard Plumbing & Heating Div., New York, N. Y.

Arcoleader—Boilers. American-Standard Plumbing & Heating Div., New York, N. Y.

Arcoliner—Boilers. American-Standard Plumbing & Heating Div., New York.

Arco Sil—Hose, ducts and duct fittings. Arrowhead Products Div., of Federal-Mogul-Bower Bearings, Inc., Long Beach, Calif.

Arcosteel—Heaters. American-Standard Plumbing & Heating Div., New York.

Arctic Circle—Unitary air conditioners. International Metal Products Co., Phoenix, Ariz.

Arid Air—Dehumidifiers. Tamms Industries Co., Chicago, Ill.

Arin—Louvers and shutters, dampers. Arex Co., Chicago, Ill.

Aristocrat 400—Air diffusers, grilles, registers. AirGuide Plastics Corp., Miami Fla.

Armacs—Treatment. Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.

Armaflex—Insulation, pipe and tubing. Armstrong Cork Co., Lancaster, Pa.

Armaglas—Insulation. Armstrong Cork Co., Lancaster, Pa.

Armalite—Insulation. Armstrong Cork Co., Lancaster, Pa.

Armaloy—Wrenches. Armstrong Bros. Tool Co., Chicago, Ill.

Armatemp—Insulating cement. Armstrong Cork Co., Lancaster, Pa.

Ar-Met—Meters. Brooks Rotameter Co., Lansdale, Pa.

Armolads—Treatment. Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.

Armored Anode—Electrolytic devices. Patrol Valve Co., The, Cleveland, O.

Armox—Pipe cutting oil. Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.

Aroclor—Heat transfer oil. Monsanto Chemical Co., St. Louis, Mo.

Arquads—Treatment. Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.

Arrowflow—Valves. General-American Valve Co., Corona Del Mar, Calif.

Arrowtrol—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Art—Direct radiation, hangers or brackets. National-U. S. Radiator Corp., Johnstown, Pa.

Artic—Refrigerant. E. I. du Pont de Nemours & Co., Electrochemical Dept., Wilmington, Del.

Asbestocel—Boiler, tank & pipe insulation. Johns-Manville, New York, N. Y.

Asbestolux—Insulation. North American Asbestos Corp., Chicago, Ill.

Asbeston—Insulation. United States Rubber Co., New York, N.Y.

Asco—Valves, relays, solenoid and solenoid cells, strainers, switches, panel and control boards. Automatic Switch Co., Florham Park, N. J.

Ashcroft—Gages, cocks, recorders, switches, testers, transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Aspir-Jet—Nozzles. Thermal Agency, Houston, Tex.

Astec—Asbestos packing. Gatke Corp., Chicago, Ill.

At-a-Glance—Gages. Krueger Sentry Gauge Co., Green Bay, Wis.

Atcotran—Indicator-controllers, indicators, recorder-controllers, recorders. Automatic Timing & Controls, Inc., King of Prussia, Pa.

Atcotrol—Switches. Automatic Timing & Controls, Inc., King of Prussia, Pa.

Athol Unions—Fittings, unions. Leavitt Machine Co., Orange, Mass.

Atlas—Adhesives. Flintkote Co., The, New York, N. Y.

Atlas—Boilers. Titusville Iron Wks. Co., The, Titusville, Pa.

Atlas—Diffusers, grilles, registers. J. B. Smith Co., Philadelphia, Pa.

Atlas—Fans, furnaces, heaters, unitary air conditioners, ventilators. Tuck-Aire Furnace Co., San Francisco, Calif.

Atlastaflex—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atlastaply—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atlastavon—Tank linings, tanks. Atlas Mineral Products Co., Mertztown, Pa.

Atlastic 77—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.

Atlastiseal—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atmo-Spray—Refrigerating condensers. Watkins Co., J.E., Maywood, Ill.

Atmos—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N.Y.

Atmos-Pak—Unitary air conditioners. Air Conditioning, Inc., Ossining, N. Y.

Atmos-Therm—Condensers. Rempe Co., Chicago, Ill.

Atom-Arc—Electrodes. Alloy Rods Co., York, Pa.

Atometer—Meters. American Moistening Co., Cleveland, N.C.

Atomick—Humidifiers, nozzles. Maid-O'-Mist, Inc., Chicago, Ill.

Attic-Air—Propeller fans. Acme Engineering & Mfg. Corp., Muskogee, Okla.

Audivent—Unit ventilators. Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.

Austoscale—Treatment. Acme Chemical Co., Milwaukee, Wis.

Auto-Airman—Air filters. American Air Filter Co., Inc., Louisville, Ky.

AutoChemic—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N.Y.

Autodraft—Fans. Tjernlund Mfg. Co., St. Paul, Minn.

Auto-Jr—Valves. Beacon Brass Co., Waltham, Mass.

Auto-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.

Autolube—Bearings. International Powder Metallurgy, Inc., Ridgway, Pa.

Automaze—Filters. Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland.

Auto-Stat—Blue and white print machines. American Photocopy Equipment Co., Chicago, Ill.

Auto-Vent—Eliminators, humidifiers, valves. Maid-O'-Mist, Inc., Chicago, Ill.

Autronic—Recorders, indicator-controllers, meters, recorder-controllers, regulators. Swartwout Fabricators, Inc., Kokomo, Ind.

Aveco—Valves. Associated Valve Co., North Wales, Pa.

Avisco—Fibers for air filters. American Viscose Corp., New York, N.Y.

Axiflo—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

Axivane—Blowers, and fans. Joy Mfg. Co., Pittsburgh, Pa.

B.A.C.—Condensers, oil coolers, cooling towers. Baltimore Aircoil Co., Inc., Baltimore, Md.

B. B.—Blast gates. Berger Bros. Co., Philadelphia, Pa.

B & C—Plates, fittings, valves, unions. Beaton & Corbin Mfg. Co., Southington, Conn.

BCA—Bearings. Bearings Co. of America, Div. of Federal Mogul Bower Bearings, Inc., Lancaster, Pa.

B. & G.—Air eliminators, circulators, coolers, condensers, fittings, heat exchangers, heaters, heating systems, superheaters, temperature regulators, tanks, valves. Bell & Gossett Co., Morton Grove, Ill.

B-H—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.

B-H No. 1—Insulation, insulating cement. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.

B-H Mono-Kover—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.

B & J—Orifices, pumps, strainers, systems, traps, valves. Barnes & Jones, Inc., Newtonville, Mass.

B & K—Pipe cutting and threading machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.

B.O.—Cocks, joints, valves. Bordo Co., Inc., L. J., Glenside, Pa.

B & P Enamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.

BV—Couplings. Dahl Co., Inc., G. W., Bristol, R. I.

B & W—Boilers, burners, desuperheaters, fuel economizers, refractories, stokers, superheaters. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

B & W—Pipe fittings, flanges, tubes and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

Bacite—Insulation, insulating cement. Bird-Archer Co., Philadelphia, Pa.

Baco—Soot destroyer, pumps. Bird-Archer Co., Philadelphia, Pa.

Badger—Time switches. Reliance Automatic Lighting Co., Racine, Wis.

Baflex—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.

Bakelite—Plastics, powders and resins. Union Carbide Plastics Co., Div. of Union Carbide Corp., New York, N.Y.

Balance-trol—Heating systems. Automatic Timing & Controls, Inc., King of Prussia, Pa.

BalanSeal—Valves. Farris Engineering Corp., Palisades Park, N. J.

Ball-Lok—Drives. V-Belt Clutch Co., Los Angeles, Calif.

Ball-O-Matic—Regulators. Elgen Mfg. Co., Long Island City, N. Y.

Ball-Rite—Drills. Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.

Balsam-Wool—Insulation. Wood Conversion Co., St. Paul, Minn.

Baltograph—Machines and film, X-ray. Balteau Electric Corp., Stamford, Conn.

Baltospot—Machines and film, X-ray. Balteau Electric Corp., Stamford, Conn.

Baltranite—Combustion chambers. Shenango Refractories, New Castle, Pa.

Bank Heat—Burners. Johnson Co., S. T., Oakland, Calif.

Banroc—Pipe insulation. Johns-Manville, New York, N. Y.

Bantam—Valves. Dahl Co., Inc., G. W., Bristol, R. I.

Bardex—Hose. Newage Industries, Inc., Jenkintown, Pa.

Barnes—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.

Barnes—Cutters. Erie Tool Works, Erie, Pa.

Bar-O-X—Protective coatings. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.

Basa Hammers—Tools. Greene, Tweed & Co., North Wales, Pa.

Basaltwool—Insulation. Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif.

Base Ray—Baseboard radiation. Burnham Corp., Irvington, N. Y.

Basevector—Fin tube radiation. Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.

Basic magnesite—Refractories and refractory cement. Basic Inc., Cleveland, O.

Basifrit—Refractories and refractory cement. Basic Inc., Cleveland, O.

Basimix—Refractories and refractory cement. Basic, Inc., Cleveland, O.

Basmor—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Basoid—Valves. Baso Inc., Milwaukee, Wis.

Basotron—Valves. Baso Inc., Milwaukee, Wis.

Bayce-Heet—Radiation. Brown Products Corp., Union, N. J.

Bay State—Packing. Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.

Bear-Cat—Tape. Norton Co., Worcester, Mass.

Beco—Boards, control systems, controllers and starters, relays, switches, tags, thermostat guards. Better Engineered Controls, Los Angeles, Calif.

Bell-Ex—Ventilators. New York Blower Co., Chicago, Ill.

Bell-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Beloit—Machines, punches, power shears. Hendley & Whittemore Co., Beloit, Wis.

Bermico—Fiber glass, pipe fittings. Brown Co., Boston, Mass.

Bermico 50—Plastic pipe. Brown Co., Boston, Mass.

Bestfelt "Lamino Sponge"—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Bestoil—Pipe oil. Oster Mfg. Co., Wickliffe, O.

Beth-Co-Weld—Pipe. Bethlehem Steel Co., Bethlehem, Pa.

Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.

Bi-Air—Burners. John Zink Co., Tulsa.

Bifurcator—Fans. DeBothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.

Big Chief—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.

Bildrite—Insulation. Insulite Co., Minneapolis, Minn.

Biltin—Heaters. Taco Heaters, Inc., Cranston, R. I.

Bilton—Pumps. Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Angeles, Calif.

Bi-Metalic—Thermometers. Taylor Instrument Companies, Rochester, N.Y.

Bi-Mix—Burners. John Zink Co., Tulsa, Okla.

Binoc—Thermometers. Taylor Instrument Companies, Rochester, N. Y.

Bitumastic—Protective coatings, enamel and lacquers, high temperature paint. Koppers Co., Inc., Pittsburgh, Pa.

Bituplastic—Coatings. Koppers Co., Inc., Pittsburgh, Pa.

Black Baking Japans—Enamels and lacquers. Hilo Varnish Co., Div. of Carpenter-Morton Co., Everett, Mass.

Blakite—Cement. Johns-Manville, New York, N. Y.

Blastaire—Fans, and blower wheels. Revcor Inc., Carpentersville, Ill.

Blazecrete—Refractories. Johns-Manville, New York, N. Y.

Blaze Pruf Silverlume—Paint. Wilbur & Williams Co., Norwood, Mass.

Blend-Air—Ducts and duct fittings. Coleman Co., Inc., The, Wichita, Kans.

Blenders—Diffusers. Coleman Co., Inc., The, Wichita, Kans.

Blessing—Pumps, pump-motor units. Wire Products Co., Baltimore, Md.

Blizzard—Air Conditioning units. Palmer Mfg. Corp., Phoenix, Ariz.

Bloapco—Dust collectors. Blower Application Co., Milwaukee, Wis.

Blu-Cold—Compressors. Lehigh Mfg. Co., Div. of Lehigh Inc., Easton, Pa.

Blu-Flame—Burners, heaters. Vacuum Gas Burner Co., Olean, N. Y.

Blue-Bantam—Valves. Henry Valve Co., Melrose Park, Ill.

Blue Circle—Heating boilers. Dunkirk Radiator Corp., Dunkirk, N. Y.

Blue Cross—Duct tape. Industrial Tape Div., Hampton Mfg. Co., New Rochelle, N.Y.

Blue Dot—Benders. Imperial Brass Mfg. Co., Chicago, Ill.

Blue Flag—Pipe wrap. Johns-Manville, New York, N. Y.

Blue-Line—Burners. Gordon & Piatt, Inc., Winfield, Kans.

Blue-Point—Cutters, threading die chasers, drills. Snap-on Tools Corp., Kenosha, Wis.

Blue Ribbon—Headers and nipples. Chicago Nipple Mfg. Co., Oak Park, Ill.

Blue Streak—Dehydrators. Wabash Corp., Chicago, Ill.

Boardman—Pump governors. Locke Regulator Co., Salem, Mass.

Boilergard—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.

Boiler-Lax—Cleaning compounds, chemical treatment. Radiator Specialty Co., Charlotte, N. C.

Boiler Solder Seal—Compounds. Radiator Specialty Co., Charlotte, N. C.

Boltaron—Plastic sheets for ducts and hoods. Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.

Boltaron—Tubing. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.

Bolt-O-Seal—Bolts. Parker Seal Co., Culver City, Calif.

Bondmaster—Adhesives. Rubber & Asbestos Corp., Bloomfield, N. J.

Bondwich—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Bonnie Scot—Boilers. National-U. S. Radiator Corp., Johnstown, Pa.

Booster—Units, fuel oil. Cleaver-Brooks Co., Milwaukee, Wis.

Borgana—Compounds, treatments. Strong, Carlisle & Hammond, Conneaut, O.

Bosco—Clay pipe. Bowerston Shale Co., The, Bowerston, O.

Box-Fin—Baseboard radiation. Edwards Engineering Corp., Pompton Plains, N.J.

Branford—Unions. Malleable Iron Fittings Co., Branford, Conn.

Brassweld—Compounds. Sight Feed Generator Co., West Alexandria, O.

Braxon—Compounds, scale removal, water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Brazaloy Fluxes—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Brazolets—Fittings. Bonney Forge & Tool Wks. Allentown, Pa.
Breeze—Adsorbers. Barnebey-Cheney Co., Columbus, O.
Breeze Master—Fans. Acme Engineering & Mfg. Corp., Muskogee, Okla.
Breezo—Fans. Buffalo Forge Co., Buffalo, N. Y.
Breezy-Air—Unitary air conditioners. Barwick Mfg. Corp., Wichita, Kan.
Brilliant Fire—Heaters. Ohio Foundry & Mfg. Co, Steubenville, O.
Brite Kote—Valves, elbows and tees. Hammond Valve Corp., Hammond, Ind.
Bronco—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Bronze-Arc C—Electrodes. Alloy Rods Co., York, Pa.
Bronze-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.
Bronzeweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Bronzochrom—Gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
Brule—Incinerators. Goder Incinerator Corp., Blue Island, Ill.
Bubbltrol—Regulators. Automatic Control Co., St. Paul, Minn.
Built-In Thinline—Unitary air conditioners. General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Bulator—Grilles. Hendrick Mfg. Co., Carbondale, Pa.
Bulk-Flo—Conveyors. Link-Belt Co., Chicago.
Bulldog—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Bulldog—Bolts, drills, expansion anchors, fasteners. Gregory Industries, Inc., Bulldog Div., Lorain, O.
Bulldog—Shears and snips. Wiss & Sons Co., J., Newark, N.J.
Bull Dog—Stocks and dies. Oster Mfg. Co., Wickliffe, O.
Bull Dog—Belting, tape. Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Bull's Eye—Glasses. Fischer & Porter Co., Hatboro, Pa.
Bullet—Filters. Sealed Unit Parts Co., Inc., New York, N. Y.
BunaN—Plastic pipe. Vanton Pump & Equipment Corp., Hillside, N. J.
Burdco—Blades, fans. Burden Co., Alan E., Los Angeles, Calif.
Burkay—Heaters. Smith Corp., A. O., Permaglas Div., Kankakee, Ill.
Burks—Pumps. Decatur Pump Co., Decatur, Ill.
Buster—Shears and snips. Lidseen of North Carolina, Inc., Hayesville, N. C.
BUX—Welding and drill positioners. Buck Mfg. Co., San Jose, Calif.

C-E—Boilers, stokers, fuel economizers. Combustion Engineering, Inc., New York.
C-E Heatmaster—Unitary air conditioners. Combustion Engineering, Inc., New York.
C-E Lamont Controlled Circulation—Heating systems. Combustion Engineering, Inc., New York, N. Y.
C-E Raymond—Air separators. Combustion Engineering, Inc., New York, N. Y.
C-E Raymond Flash Dryer—Dryers. Combustion Engineering, Inc., New York, N. Y.
C-E Spreader—Stokers. Combustion Engineering. Inc., New York, N. Y.
C-H—Alarms, blocks, control systems, pilot and signal lights, solenoid and solenoid coils, controllers and starters, heaters, relays, regulators, switches, operators. Cutler-Hammer, Inc., Milwaukee, Wis.
CH—Heaters. McQuay, Inc., Minneapolis.
CHPE Controller—Regulators. Hays Corp., The, Michigan City, Ind.
C & L—Heaters, torches. Clayton & Lambert Mfg. Co., Louisville, Ky.
CM Puller—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
CMC Aluminum—Enamels and lacquers. Acorn Refining Co., Cleveland, O.
CP—Aftercoolers, clamps, compressors, engines, expanders, grinders and grinding wheels, hoists, machines, pumps, tools. Chicago Pneumatic Tool Co., New York, N. Y.
C.P.C.—Hose and tubing clamps, plastic pipe flanges, belting, plastic pipe nipples. Commercial Plastic Co., Chicago, Ill.
C & R—Regulators. Automatic Control Co., St. Paul, Minn.
CS—Unitary air conditioners. Young Radiator Co., Racine, Wis.
CSP—Transformers. Westinghouse Electric Corp., Pittsburgh, Pa.
C.V.—Plastic pipe. Mueller Brass Co., Port Huron, Mich.
CW—Pipe. Tubular Div., The National Supply Co., Pittsburgh, Pa.
CWF—Chillers. Taco Heaters, Inc., Cranston, R. I.
Cablestat—Cable. Wiegand Co., Edwin L., Pittsburgh, Pa.
Cadillac—Portable hoists. Aluminum Products, Inc., Fort Lauderdale, Fla.
Cadillac—Meters. Central Station Steam Co., Detroit, Mich.
Cafco—Insulation cement. United States Mineral Wool Co., Stanhope, N. J.
Calco—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Cal-Fin—Pipe, tubing, radiation. Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Calktite—Cement and compounds. United States Stoneware Co., New York, N. Y.
Calol—Protective coatings. Standard Oil Co. of California, San Francisco, Calif.
Calorex—Oil burners, fuel oil preheaters, fuel oil units. W. N. Best Combustion Equipment Co., Inc., Little Ferry, N. J.
Calorimeter Comparator—Btu meters. Liaison Engineering Services, Garland, Tex.
Caltemp—Insulation, insulating cement. Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., San Francisco, Calif.
Camomatic—Valves. Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Campco—Plastic sheets for ducts and hoods. Chicago Molded Products Corp., Chicago, Ill.
Capillary—Air washers. Clarage Fan Co., Kalamazoo, Mich.
Capillary—Air washers, humidifiers, cooling towers, unitary air conditioners. Air & Refrigeration Corp., New York, N. Y.
Capitolaire—Furnaces, compressors, water chillers, refrigerating condensers, radiation, unitary air conditioners. National-U. S. Radiator Corp., Johnstown, Pa.
Caposil—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Caposite—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Carbolite—Soot destroyers. Ampion Corp., Long Island City, N. Y.
Carbozite—Coatings. Ohmlac Paint & Refining Co., Long Island City, N. Y.
Cascade—Water heaters. The Cleveland Heater Co., Cleveland, O.
Cassel—Templates. Graphic Indicator Co., Los Angeles, Calif.
Castalu—Fans, wheels. R & R Metal Products, Inc., Chicago, Ill.
Cast-Refract—Refractories. Quigley Co., Inc., New York, N. Y.
Catch-All—Dehydrators and filters. Sporlan Valve Co., St. Louis, Mo.
Cathochem—Water treatment. Electro Rust-Proofing Corp., Belleville, N. J.
Causul—Valves. Lunkenheimer Co., Cincinnati, O.
CC Coatings—Protective coatings, paint. Chemical Solvent Co., Birmingham, Ala.
Cemcoat—Enamels and lacquers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Cementseal—Enamels and lacquers. Acorn Refining Co., Cleveland, O.
CenTraVac—Compressors. Trane Co., The, La Crosse, Wis.
Centri-Chem—Centrifugal pumps. Eco Engineering Co., Newark, N. J.
Centripac—Packing. Johns-Manville, New York N. Y.
Centripeller—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Centri-Vent—Roof ventilators. Midwest Airmoving Corp., Willoughby, O.
Century—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.
Ceramiduct—Ducts and duct fittings. Straitsville Brick Co., New Straitsville, O.
Cert-a-bar—Conduits. U-Con Co., Annapolis, Md.
Certified Climate—Unitary air conditioners, washers. Parks-Cramer Co., Fitchburg, Mass.
Cesco—Fittings. Columbia Engineering Service Co., Santa Rosa, Calif.
C-Flux—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Challenger—Hoists. Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Chamfer Trade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Champ—Non-metal hose. Hose Accessories Co., Philadelphia, Pa.
Champion—Furnaces, heaters. National Heater Co., Inc. St. Paul, Minn.
Champion—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Champion—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Chan-All—Pipe storage racks. The Modern Hanger Corp., Cleveland, O.
Channalloy—Tools. Champion-DeArment Tool Co., Meadville, Pa.
Charg-A-Can—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Chemiseal—Pipe couplings, mechanical shaft seals. Garlock Packing Co., The, Palmyra, N. Y.
Chemiseal—Seals, gaskets, joints, protective coatings, packing, couplings, shaft. United States Gasket Co., Camden, N. J.
Chem-O-Feeder—Feeders, pumps, water treatment. B-I-F Industries, Proportioneers Div., Providence, R. I.
Chem-O-Shot—Pumps. B-I-F Industries, Proportioneers Div., Providence, R. I.
Chempac—Gaskets, packing. Johns-Manville, New York, N. Y.
Chem-Rem—Protective coatings. Speco, Inc., Cleveland, O
Chem-Weld—Plastic pipe. Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Chesterflex—Wire. Chester Cable Corp., Chester, N. Y.
Chesterflur—Wire. Chester Cable Corp., Chester, N. Y.
Chevron—Packing. Garlock Packing Co., Palmyra, N. Y.
Chex-Spray—Valve bonnet shields. Industrial Products Co., Philadelphia, Pa.
Chicago—Brakes. Dreis & Krump Mfg. Co., Chicago Ill.
Chill Air—Unitary air conditioners, fans. National Engineering & Mfg. Co., Sedalia, Mo.
Chil-Lator—Coolers. McQuay, Inc., Minneapolis, Minn.
Chill-Pak—Refrigerating compressors. Dialatemp, Inc., St. Louis, Mo.
CHILL VACTOR—Steam jet compressors. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Chimney Sweep—Chemical destroyers. Coughlan Co., G. N., West Orange, N. J.
Chinook—Ferrous heating surface. Bayley Blower Co., Milwaukee, Wis.
Chlorimet—Heat exchangers, fans, fittings, heaters, pipe, pumps, nozzles, valves. Duriron Co., Inc., The, Dayton, O.
Chlorinjector—Water chlorinators. Clayton Mark & Co., Evanston, Ill.
Chlorinizer—Chlorinators, and treatment. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Chlor-O-Feeder—Feeders, pumps. B-I-F Industries, Proportioneers Div., Providence, R. I.
Chlor-O-Mite—Pumps, water treatment. B-I-F Industries, Proportioneers Div., Providence, R. I.
Chore Boy—Burners. Standard Fuel Engineering Co., Detroit, Mich.
Chromalox—Heat exchangers, electric heating panels, preheaters, pipe thawers, fuel oil units, dryers, indicator-controllers, heating systems, radiation, superheaters, thermostats, switches, ventilators, unit heaters. Wiegand Co., Edwin L., Pittsburgh, Pa.
Chrome—Packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chrome Lock—Gaskets, tape. Products Research Co., Los Angeles, Calif.
Chromend—Electrodes. Arcos Corp., Philadelphia, Pa.
ChromiCoat—Protective coatings. Oakite Products, Inc., New York, N. Y.
Chromix—Refractories. Quigley Co., Inc., New York, N. Y.
Chromolox—Protective coatings. Master Mechanics Co., Cleveland, O.
Chronoflo—Flow meters, gages, indicators, recorders. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Chronometer—Valves. Defender Instrument & Regulator Co., Boody, Ill.
C-I Extra High—Paint for hot surfaces. Chem Industrial Co., Brooklyn, O.
Cinch—Expansion bolts, expansion anchors. National Lead Co., New York, N. Y.
Clair-Tex—Connections. St. Clair Rubber Co., Detroit, Mich.
Clamp-A-Leak—Pipe repair clamps. Chelsea Metal Stamping Co., New York, N. Y.
Clarco—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Cla Rite—Filters. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Claymont—Steel pipes. Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Clean-Flo—Motors. Allis Co., Louis, The, Milwaukee, Wis.
Clean Rignt—Soot destroyers. General Filters, Inc., Novi, Mich.
Clear-stream—Treatment. Reynolds Water Conditioning Co., Detroit, Mich.
Clearstream—Pipe fittings; plastic pipe; plastic tubing. Yardley Plastic Co., Columbus, O.
Clearview—Gages. Boston Machine Works Co., Lynn, Mass.
Cleerall—Air filters. Continental Air Filters, Inc., Louisville, Ky.
Cleveland—Heaters. Hotstream Heater Co., Cleveland, O.
Cliff—Boilers, water heaters. Terre Haute Boiler Works Co., Terre Haute, Ind.
Climate Changer—Unit air conditioners. Trane Co., The, LaCrosse, Wis.
Climate-Lab—Test chambers. American Instrument Co., Inc., Silver Spring, Md.
Clipper—Fans. Trade-Wind Div., Robbins & Myers, Inc., Pico Rivera, Calif.
Clipper—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Clipper Seals—Packing seals. Johns-Manville, New York.

Cliptak—Adhesives. Cain Mfg. Inc., Birmingham, Ala.
Clorinal—Electricap capacitors. Sprague Electric Co., North Adams, Mass.
Coal Chuter—Coal and ash conveyors. New London Engineering Co., New London, Wis.
Coal-Pak Automatic—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Cocheo—Belting. Williams & Son, I. B., Dover, N. H.
Coeco—Controls and dampers. Combustion Equipment Co., Moline, Ill.
Cold Generator—Chillers. Trane Co., The, La Crosse, Wis.
Coldmoble—Unitary air conditioners. McGraw-Edison Co., Clark Div. & Tropic-Aire Div., Chicago, Ill.
Cold Plate—Coils, condensers, coolers. Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Color-Port—Gages. Yarnall-Waring Co., Philadelphia, Pa.
Coltemp—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.
Combi-Matic—Burners. Power-Flame Div., Inc., Grandview, Mo.
Combustioneer—Stokers. Automatic Solid Fuels Equipment, Inc., Indianapolis, Ind.
Comfort Control—Temperature regulators. Bell & Gossett Co., Morton Grove, Ill.
Comfort-Flo—Furnaces. Montag Inc., Portland, Ore.
Comfortline—Baseboard radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Comfostat—Thermostats. Johnson Service Co., Milwaukee, Wis.
Cominco—Insulating cement, insulation. United States Mineral Wool Co., Stanhope, N. J.
Commander—Boilers. National-U. S. Radiator Corp., Johnstown, Pa.
Commercial-Aire—Heaters. Mammoth Furnace Co., Minneapolis, Minn.
Compact Scotch—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Compacunit—Pumps. Warrens Pumps, Inc., Warren, Mass.
Compak—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Compar—Plastic tubing, vibration absorbers, non-metal hose and fittings. Resistoflex Corp., Roseland, N. J.
Compass—Belting. Goodyear Tire & Rubber Co., Akron, O.
Compound Lever—Hand shears and snips. Bartlett Mfg. Co., Detroit, Mich.
Conco—Boiler cleaning compounds, water treatment. Continental Products Co., Euclid, O.
Condenseal—Pipe insulation, tubing. Jarrow Products, Inc., Chicago, Ill.
Condenso-Purge—Refrigerant gas purgers. Watkins Co., J.E., Maywood, Ill.
Condor—V-belts, hose, pipe. Raybestos-Manhattan, Inc., Passaic, N. J.
Condo-Vac—Vacuum pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Conflex—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Coni-Vane—Ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.
Connectite—Gaskets. American Felt Co., Glenville, Conn.
Connect-O-Matic—Pipe couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Conomanual—Air filters. Continental Air Filters, Inc., Louisville, Ky.
Conomatic—Filters. Continental Air Filters, Inc., Louisville, Ky.
Conomotors—Duct and valve operators. Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Conseco—Water chillers, oil coolers, heat exchangers, filters, headers, water heaters, joints, preheaters, separators, superheaters. Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Conso—Ventilators. Consolidated General Products, Inc., Houston, Tex.
Consolaire—Unitary air conditioners. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Consolidated—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Constellation Line—Arc welders. Trindl Products, Ltd., Chicago, Ill.
Con-Tac-Ton—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Continental—Boilers. Boiler Engineering & Supply Co., Phoenixville, Pa.
Controlair—Valves. Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Converto—Roof ventilators. Ammerman Co., Inc., Stillwater, Minn.
Conveyoflo—Conveyors. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Conveyor—Pulleys and Sheaves. The American Pulley Co., Philadelphia, Pa.
Con-Vol Units—Mixing units for double duct air conditioning units. Thermotank, Inc., Products Div., Detroit, Mich.
Coolero—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N.Y.
Coolex—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Coolite—Windows. Mississippi Glass Co., St. Louis, Mo.
Coolmaster—Unit coolers. Kramer Trenton Co., Trenton, N. J.
Cool-Mate—Unitary air conditioners. Weil-McLain Co., Michigan City, Ind.
Cooltong—Torches. Lincoln Electric Co., Cleveland, O.
Coolube—Oil. Warren Refining & Chemical Co., The, Cleveland, O.
Copper Boy—Pipe hangers and supports. Western Wire Products Co., St. Louis, Mo.
Copper-Pak—Electric radiators. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Cop-R-Loy—Sheets. Wheeling Corrugating Corp., Wheeling, W. Va.
Cop-R-Loy—Sheets, pipe. Wheeling Steel Corp., Wheeling, W. Va.
Copr-fibre—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.
Copr-Tube—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Copyflex—Blueprint machine. Bruning Co., Inc., Charles, Mt. Prospect, Ill.
Cordan—Leather belting and V belts. Sikes Co., S. R., Minneapolis, Minn.
Core Bore—Masonry drills. Diamond Products, Inc., Elyria, O.
Cor-In Galvanode—Electrolytic devices. Rotometals, San Francisco, Calif.
Cork-Flex—Bases and pad, absorbers, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
Cork-Rib—Bases and pad, absorbers. Vibration Mountings, Inc., Corona, N. Y.
Corrocote—Coatings. Chemical Coatings & Engineering Co., Media, Pa.
Corrodicide—Water treatment, compounds. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Corrodine—Compound and water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Corson-Cerveny Micro-Bellows Pump—Feeders. Research Appliance Co., Allison Park, Pa.
Corvel—Protective coatings. Polymer Corp., The, Reading, Pa.
Cottrell—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
C-O-TWO—Fire extinguishing systems. Fyr-Fyter Co., Dayton, O.
Counterflo—Furnaces. Dravo Corp., Machinery Div., Pittsburgh, Pa.
Cox—Water heaters. O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Coxe—Stokers. Combustion Engineering, Inc., New York, N. Y.
Cozy—Wall heaters. Advance Furnace Co., Wichita, Kans.
Crag—Treatment. Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
Crescent—Valves. Powell Co., Wm., The, Cincinnati, O.
Cresline—Plastic fittings, pipe, tubing. Crescent Plastics, Inc., Evansville, Ind.
Crest—Water heaters. Day & Night Mfg. Co., LaPuente, Calif.
Crispin—Air eliminators, pipe joints, valves. Multiplex Mfg. Co., Berwick, Pa.
Croloy—Pipe, pipe fittings, flanges, tubes, and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Cross-Flo—Dehydrators. Remco, Inc., Zelienople, Pa.
Cryscoat—Protective coatings. Oakite Products, Inc., New York, N. Y.
Crystal—Protective coatings. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Crystolon—Refractories and refractory cement, protective metals, furnace cement. Norton Co., Worcester, Mass.
Cube-Fill—Insulation. Carney Co., Inc., The, Mankato, Minn.
Cupralum—Coils and panels. Knapp Mills, Inc., Long Island City, N. Y.
Curtiss—Unitary air conditioners. Kleer Kleen Mfg. Co., Hayward, Calif.
Cushioned Power—Valves. White-Rogers Co., St. Louis, Mo.
Cutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Cut-O-Matic—Flame cutters. National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Cut Trode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Cyclo-Core—Drills. New England Carbide Tool Co., Inc., Medford, Mass.
Cyclon—Plastic tubing. Munray Products, Div. of Fanner Mfg. Co., Cleveland, O.
Cyclone—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Cyclonetic—Burners. Webster Engineering Co., Tulsa, Okla.
Cyclothene—Plastic tubing. Munray Products, Div. of Fanner Mfg. Co., Cleveland.
Cyclo-trell—Dust collectors. Research-Cottrell, Inc., Bound Brook, N.J.
Cyclo-Twist—Drills. New England Carbide Tool Co., Inc., Medford, Mass.
Cycoil—Dust Collectors. American Air Filter Co., Inc., Louisville, Ky.

DFN—Dehydrators, hose, filters, sight glasses, mufflers, strainers. McIntire Co., The, Livingston, N. J.
D.I.P.—Bends, insulation, conduit, pre-insulated pipe. Durant Insulated Pipe Co., E. Palo Alto, Calif.
D.I.P.—Insulation, conduit, pre-insulated pipe. Durant Insulated Pipe Co., Inc., Cleveland, O.
DRC-Blue Circle—Baseboard radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
DRH Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
DX—Softeners. Stover Water Softener Co., St. Charles, Ill.
Dacor—Adsorbers, air filters. Barnebey-Cheney, Inc., Columbus, O.
Daftinaire—Humidifiers HERRmidifier Co., Lancaster, Pa.
Dall—Nozzles. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Dampermatic—Baseboard radiation. Beacon-Morris Corp., Boston, Mass.
Danco—Filters, pipe fittings, plastic pipe, tubing. Danielson Mfg. Co., Danielson, Conn.
Darcova—Packing. Sims Pump Valve Co., Hoboken, N. J.
Dart—Unions, fittings. Fairbanks Co., The, New York, N. Y.
Day-Nite Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Day-Steel—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Dean—Cleaners. Pierce Co., Wm. B., The, Buffalo, N. Y.
Dearsol—Fuel oil treatment. Dearborn Chemical Co., Chicago, Ill.
Debanode—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Debecote—Coatings. Debevoise Co., The, Brooklyn, N. Y.
Decorator—Thermostats. Mears Electric Controls, Inc., Portland, Ore.
Decosteel—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Deep Bed—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Deflectrol—Turning vanes. Barber-Colman Co., Rockford, Ill.
Defrostolator—Hot gas defrosting systems. Tenney Engineering, Inc., Union, N. J.
Dehydrators—Dehumidifiers. Selas Corp. of America, Dresher, Pa.
Dekoron—Protective coatings, wire, tubing. Moore & Co., Samuel, Mantua, O.
Dekoron E-Z—Fittings. Moore & Co., Samuel, Mantua, O.
Delaytrol—Valves. Webster Electric Co., Racine, Wis.
Delrin—Plastics, powders and resins. du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.
Delta—Steel boilers. Zingham Co., William C., Chicago, Ill.
Deltadyne—Indicator-Controllers. Aircraft Porous Media, Inc., Glen Cove, N. Y.
Demi—Valves. Dahl Co., Inc., G. W., Bristol, R. I.
Demi-Purge—Meters. Dahl Co., Inc., G. W., Bristol, R. I.
Demon Air-Set—Refractories. Plibrico Co., Chicago, Ill.
Densitrol—Indicators. Precision Thermometer & Instrument Co., Philadelphia, Pa.
Deodorite—Air freshening compounds. Barnebey-Cheney Co., Columbus, O.
Deoterge—Cleaning compounds. Airkem, Inc., New York, N.Y.
Deoxidine—Cleaning compounds. Amchem Products, Inc., Ambler, Pa.
Derco—Terminal seals for compressors. Watsco, Inc., Hialeah, Fla.
Dereka—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Desco—Blower wheels. Denbo Engineering and Sales, Inc., Indianapolis, Ind.
Design-Air—Diffusers. Krueger Air Conditioning Co., Tucson, Ariz.
De-Sta-Co.—Fan housings, pipe clamps, valves. Detroit Stamping Co., Detroit.
Detect-A-Fire—Controls. Fenwal Inc., Ashland, Mass.
Detroit—Traps. Nason Co., Clarkston, Mich.
Dewpointaire—Recorders. Cargocaire Engineering Corp., New York, N. Y.
Dewpointer—Recorders. Cargocaire Engineering Corp., New York, N.Y.
Dexter—Valve reseaters, air separators, steam traps. Leavitt Machine Co., Orange, Mass.
Di-Acro—Benders, brakes, machines, punches, shears. O'Neil-Irwin Mfg. Co., Lake City, Minn.
Dialaire—Unitary air conditioners. Dialatemp, Inc., St. Louis, Mo.

Dial-A-Speed—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Diamalloy—Shears and snips, tools. Diamond Tool & Horseshoe Co., Duluth, Minn.
Diamond—Compounds, enamels and lacquers. Thompson and Co., Oakmont, Pa.
Diamond—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Diamond—Adsorbers, filters, water treatment. Oshkosh Filter & Softener Co., Oshkosh, Wis.
Diamond H—Switches, thermostats, relays. Hart Mfg. Co., Hartford, Conn.
Diaphlex—Bellows, relays, solenoids, and switches. Cook Electric Co., Chicago, Ill.
Dieselite—Compounds. Metropolitan Refining Co., Inc., Long Island, N. Y.
Diffusaire—Diffusers. Hart & Cooley Mfg. Co., Holland, Mich.
Dilecto—Plastic pipe and tubing gaskets. Continental Diamond Fibre Corp., Newark, N. J.
Dill Dust Spot Tester—Tester, dust spot. Research Appliance Co., Allison Park, Pa.
Dimetcote—Coatings. Amercoat Corp., South Gate, Calif.
Directoray—Heaters. Salton Mfg. Co., Inc., New York, N. Y.
Directrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Divco—Fittings, gaskets, coils, pipe and tubing, sheets, plugs, solder, valves. Division Lead Co., Summit, Ill.
Dixigas—Gas welding rod. Atlantic Steel Co., Atlanta, Ga.
Dixisteel—Angles, bars, beams, channels and tees. Atlantic Steel Co., Atlantic, Ga.
Do-All—Drills, tools, electric hammers, plaster groovers. Wodack Electric Tool Corp., Chicago, Ill.
Domette—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Domex—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Dominion—Gaskets, packing. Darcoid Co., Inc., New York, N. Y.
Do-Mor-Ad—Saw tools. Pioneer Tool Co., Racine, Wis.
Dorex—Adsorbers. Connor Engineering Corp., Danbury, Conn.
Doro-Chrome—Benders, cutters, tools, wrenches. Duro Metal Products Co., Chicago, Ill.
Dot—Insulation fasteners. Carr Fastener Co., Div. of United Carr Fastener Corp., Cambridge, Mass.
Double Check—Boiler compounds. Hampton-Cross Co., The, Louisville, Ky.
Double Diamond—Hygrometers, regulators, psychrometers, thermometers. H. B. Instrument Co., Philadelphia, Pa.
Double-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Double Retort Stoker—Stokers. Detroit Stoker Co., Monroe, Mich.
Double-Seal—Copper tube fittings. Hays Mfg. Co., Erie, Pa.
Doubleton—Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
DovRloy—Steel sheets. Reeves Steel & Mfg. Co., Dover, O.
Downblast—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Downflow—Unit heaters. McQuay, Inc., Minneapolis, Minn.
Draft-A-Justor—Draft controls. Preferred Utilities Mfg. Corp., New York, N. Y.
Draft King—Caps, vent flue. Wood Mfg. Co., A. R., Luverne, Mich.
Draft Korektor—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Draft-O-Stat—Barometric controls. Hotstream Heater Co., Cleveland, O.
Draftrite—Gages. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Draft Stabilizer—Draft controls. Boston Machine Works, Co., Lynn, Mass.
Dragnet—Leak detectors, testers. Universal Controls Corp., Dallas, Tex.
Dragon—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N.J.
Drainator—Traps. Coe Mfg. Co., Painesville, O.
Drain-Dri—Sump pumps. Yeomans Bros. Co., Melrose Park, Ill.
Draintrol—Traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Dri-Acid—Chemical treatment. Allen Co., Robert G., Mechanicsville, N.Y.
Dricon—Condensers. Recold Corp., Los Angeles, Calif.
Dri-Cooler—Condensers. Marley Co., The, Kansas City, Mo.
Dri-Cor—Dehydrators, filters. Henry Valve Co., Melrose Park, Ill.
Dri-Fan—Condensers, cooling towers. Recold Corp., Los Angeles, Calif.
Drifreeze—Dehydrant and acid neutralizer, dehydrators. Berna Corp., Garwood, N. J.
Drilfast—Anchors. U. S. Expansion Bolt Co., York, Pa.
Driline—Dehumidifiers. Desomatic Products, Inc., Falls Church, Va.
Drillmaster—Electric and pneumatic drills. Diamond Products, Inc., Elyria, O.
Dril-Tec—Gas welding rods. Eutectic Welding Alloys Corp., Flushing, N.Y.

Dri-Pipe—Insulation. Mystik Adhesive Products, Inc., Chicago, Ill.
Dri-Set—Refractories and refractory cement. Basic Inc., Cleveland, O.
Drive-IT—Hangers and supports, fasteners. Omark Industries Inc., Portland, Ore.
Drumulator—Dryers. Jeffrey Mfg. Co., Columbus, O.
Drycid—Treatment. Oakite Products, Inc., New York, N. Y.
Dry-Eye—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Dry-Ex—Water chillers, oil coolers. Acme Industries, Inc., Jackson, Mich.
Dryfol—Insulation. Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Drygalv—Protective coatings. American Solder & Flux Co., Philadelphia, Pa.
Dry-Ice—Refrigerants. Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York.
Drymaster—Dehumidifiers. Dryomatic Corp., Alexandria, Va.
Dryvin—Expansion bolts. Star Expansion Industries Corp., Mountainville, N.Y.
Dual Adjusta-Flo—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
Dualaire—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Dualarc—Arc Welders. Electric Arc, Inc., Newark, N. J.
Dual-Clone—Dust collectors. Day Co., The, Minneapolis, Minn.
Dual-Dial—Gages. Rochester Mfg. Co., Inc., Rochester, N. Y.
Dualene—Fuel oil treatment. Allen Co., Robert G., Mechanicsville, N. Y.
Dualsteel—Unions. Rockwood Sprinkler Co., Worcester, Mass.
Dualvector—Unitary air conditioners. Kritzer Radiant Coils, Inc., Batavia, Ill.
Dualvent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Dubl-Dome—Heat insulating windows. Pam Co., The, Portland, Ore.
Duboth—Boiler water treatment, compounds. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Duclone—Dust collectors. Ducon Co., The, Mineola, N. Y.
Duco—Enamels and lacquers. du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Ductak—Adhesives. Cain Mfg. Inc., Birmingham, Ala.
Ductatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Ductilend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
Ductite—Tape. Johns-Manville, New York, N.Y.
Ducturns—Vanes. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Ductype—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dulux—Enamels and lacquers. du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Dum Dum—Sealing compounds, protective coatings. Arco Co., The, Cleveland, O.
Duo Blo—Air heaters. American Furnace Co., St. Louis, Mo.
Duo Equalizing HypTor—Pipe joints. Zallea Brothers, Wilmington, Del.
Duomeens—Protective coatings for metals, water treatment. Armour Industrial Chemical Co., Div. of Armour & Co., Chicago, Ill.
Duonetic—Gas and oil burners. Webster Engineering Co., Tulsa, Okla.
Duo-Stat—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Duotrol—Regulators, indicators, switches. Automatic Control Co., St. Paul, Minn.
Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Duplex—Pipe cutting machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Duplex Twin Rail—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Durable—Pipe flanges and pipe fittings. Nuclear and Power Equipment Corp., S. San Francisco, Calif.
DuraBilt—Registers. Auer Register Co., Cleveland, O.
Duracor—Ducts and duct fittings, hoods, plastic sheets for ducts and hoods. Ceilcote, Inc., Cleveland, O.
Duracron—Enamels and lacquers. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Duradiant—Burners. Selas Corp. of America, Dresher, Pa.
Dura-Flex—Registers. Auer Register Co., Cleveland, O.
Duraflex—Stokers. Canton Stoker Corp., Canton, O.
Dura-Line—Registers. Auer Register Co., Cleveland, O.
Duramesh—Pipe wrap. Johns-Manville, New York, N. Y.
Duranite—Enamels and lacquers. Glidden Co., Nubian Div., Chicago, Ill.
Duratape—Pipe wrap. Johns-Manville, New York, N. Y.
Durco—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.

Durcopump—Fans, fittings, heaters, exchangers, nozzles, pumps, pipe, valves. Duriron Co., Inc., Dayton, O.
Durethene—Vapor barriers. Koppers Co., Inc., Pittsburgh, Pa.
Durex—Bearings. Moraine Products Div., General Motors Corp., Dayton, O.
Durichlor—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Duridine—Protective coatings. Amchem Products, Inc., Ambler, Pa.
Durimet—Fans, fittings, heaters, exchangers, nozzles, pumps, pipe, valves. Duriron Co., Inc., Dayton, O.
Durolite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Durospead—Heads. Grinnell Co., Inc., Providence, R. I.
Dur-X—Plastic fittings and pipes. Franklin Plastics, Inc., Franklin, Pa.
Dust King—Dust collectors. Dust Filter Co., Chicago, Ill.
Dustkop—Dust collectors. Aget Mfg. Co., Adrian, Mich.
Dust-Magnet—Filters. Stoddard Industries, Inc., Cudahy, Wis.
Dust Master—Dust collectors. Bannister Co., Inc., Cambridge, Mass.
Dust-Master—Dust collectors. Cincinnati Fan and Ventilating Co., Cincinnati, O.
Dustronic—Air filters. Radex Corp., Chicago, Ill.
Dust-Stop—Air Filters. Owens-Corning Fiberglas Corp., New York, N. Y.
Dustube—Dust collectors. Wheelabrator Corp., Mishawaka, Ind.
Dutch Boy—Solder, protective coatings, enamels and lacquers. National Lead Co., New York, N. Y.
Duxbak—Leather belting and packing. Schieren Co., Chas. A., Camden, N. J.
Dux-Sul-Glue—Adhesives. Grant Wilson, Inc., Chicago, Ill.
Dux-Sulation—Insulation. Grant Wilson, Inc., Chicago, Ill.
Duzall—Solder fluxes. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Dy-Chek—Dye penetrant. Turco Products, Inc., Los Angeles, Calif.
Dyanfan—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Dycon—Air Filters. Continental Air Filters, Inc., Louisville, Ky.
Dylan—Plastics, powders and resins. Koppers Co., Inc., Pittsburgh, Pa.
Dylene—Plastics, powders and resins. Koppers Co., Inc., Pittsburgh, Pa.
Dylite—Plastics, powders and resins. Koppers Co., Inc., Pittsburgh, Pa.
Dynaflow—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dyna-Line—Electric motors, reducers. Brown-Brockmeyer Co., Inc., Dayton, O.
Dynatrol—Liquid level switches. Automation Products, Inc., Houston, Tex.
Dyna-V—Belts, drives. Dodge Mfg. Corp., Mishawaka, Ind.
Dyne-Aire—Heaters. American Foundry & Furnace Co., Bloomington, Ill.
Dynetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
Dynetric—Balancing equipment. Gisholt Machine Co., Madison, Wis.
Dyno-Mite—Drills. Millers Fall Co., Greenfield, Mass.

E B Weld Insert—Rings. Arcos Corp., The, Philadelphia, Pa.
E-C—V belts. Goodyear Tire & Rubber Co., Akron, O.
E C & M—Motor controllers and starters, switches. Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
EFM-Fire Jet—Conveyors. Electric Furnace-Man, Inc., Emmaus, Pa.
EKCCO—Fans. E. K. Campbell Co., Kansas City, Mo.
EMD—Blowers. L. J. Wing Mfg. Co., Linden, N. J.
EMS—Compounds, destroyers, feeders, water filters, scale removal, water softeners, treatment. Smith Chemical Co., E. W., La Puente, Calif.
ES—Sheets. Eastern Stainless Steel Corp., Baltimore, Md.
E-Z—Registers, regulators, hangers and supports. Acme Mfg. Co., Philadelphia, Pa.
E.Z.—Hangers or brackets, Inserts. Healey Ruff Co., St. Paul, Minn.
E-Z—Cutters. Collins Machinery Corp., Los Angeles, Calif.
E-Z—Soot destroyers. Normal Chemical Co., St. Paul, Minn.
EZ Code—Electric wire. Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.
E-Z Flex—Pipe joints. Beacon Brass Co., Waltham, Mass.
E-Z-On—Regulators. Gerett Corp., M. A., Milwaukee, Wis.
E-Z See—Glasses. Remco, Inc., Zelienople, Pa.
E-Z View—Chemical feeders. Clayton Mark & Co., Evanston, Ill.

E-Z-Wash—Air filters. Continental Air Filters, Inc., Louisville, Ky.
Eagleline—Wall or roof intakes for outdoor air. Titus Mfg. Corp., Waterloo, Ia.
Easy-Flo—Solder. Handy & Harman, New York, N. Y.
Easy-Wrap—Protective coatings, pipe and tubing insulation, pipe wrap. Rhopac, Inc., Skokie, Ill.
Ebko—Conduits, exchangers, pipe, systems. Kaiser Co., E. B., Glenview, Ill.
Econ-O-Fab—Duct connections, ducts and duct fittings. Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Econoflow—Regulators. Smith Welding Equipment Corp., Minneapolis, Minn.
Econ-O-Matic—Motor bases. American Pulley Co., The, Philadelphia, Pa.
Economite—Commercial and industrial gas burners. Mid-Continent Metal Products Co., Chicago, Ill.
Econ-o-Mizer—Cooling towers. Acme Industries, Inc., Jackson, Mich.
Economizer—Nozzles. Bahnson Co., Winston-Salem, N. C.
Economo—Burners. Dalzen Mfg. Co., St. Clair, Mich.
Economy—Unit ventilators. Arex Co., Chicago, Ill.
Econostat—Heating systems. Barber-Coleman Co., Rockford, Ill.
Econovent—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Econo-Watt—Electric motors. Redmond Co., Inc., Owosso, Mich.
EDCO—Heaters. Cauhorn Distributing Co., Detroit, Mich.
Edgetallic—Gaskets. Darcoid Co., Inc., New York, N. Y.
Effico—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Eisen-Heiss—Protective coatings, enamels and lacquers, high temperature paint. Master Mechanics Co., Cleveland, O.
Ejectopump—Pumps. Ferro Corp., Cleveland, O.
Elastic Metallic—Packing. Chesterton Co., A. W., Everett, Mass.
Elastic Porcelain—Tank linings. Porce-Lin Tank Lining Co., Detroit, Mich.
Elasto Rib—Vibration isolating bases. Korfund Co., Inc., Long Island City, N. Y.
Elaterite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.
Elbolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
Electric—Pipe cleaning machines. Spartan Tool Div., H. D. Conkey & Co., Chicago, Ill.
Electric Filter Watchman—Gages. Herbusch Corp., The, St. Louis, Mo.
Electric Trimline Baseboard—Radiators. Vulcan Radiator Co., Hartford, Conn.
Electrifugal Pumps—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electrionic — Alarms. Barber-Colman Co., Rockford, Ill.
Electro-Cell—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Electro-Flo—Air filters. Donie Engineering Sales Co., Indianapolis, Ind.
Electroflo—Valves. Hays Mfg. Co., Erie, Pa.
Electrofluid—Speed changers. Link-Belt Co., Chicago, Ill.
Electro Flux-Stik—Solder. Lake Chemical Co., Chicago, Ill.
Electro-Hot—Heaters. Red Spot Electric Co., Tacoma, Wash.
Electro-Klean—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Electro-Matic—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Electromaze—Air filters. Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Electro-Mesurflo—Valves. Hays Mfg. Co., Erie, Pa.
Electro-Mist—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Electromite—Valves. Hays Mfg. Co., Erie, Pa.
Electro-Pl—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Electr-O-Probe—Heating boiler cut-offs, indicators, switches. Instruments, Inc., Tulsa, Okla.
Electro-Rod—Pipe cleaning machines. Spartan Tool Div., H. D. Conkey & Co., Chicago, Ill.
Electro-Sheet Foil—Sheets. American Brass Co., Waterbury, Conn.
Electroweld—Welders. Electric Arc, Inc., Newark, N. J.
Electro-Wind—Ventilators. Allen Cooler & Ventilator Inc., Rochester, Minn.
Electrunite—Stainless steel tubing. Republic Steel Corp., Cleveland, O.
Elektra—Air filters. Extraer, Inc., Houston, Tex.
Elemenex—Electrical capacitors. Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Elgex—Steam system treatment. Elgin Softener Corp., Elgin, Ill.
Elgin—Arc welders. Borm Mfg. Co., Elgin, Ill.
Elgin—Louvers and shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.
ElKoloy—Welders. P. R. Mallory & Co., Inc., Indianapolis, Ind.
ELKonite—Welders. P. R. Mallory & Co., Inc., Indianapolis, Ind.
ELKonium—Welders. P. R. Mallory & Co., Inc., Indianapolis, Ind.
Ell-Jac—Pipe covering protectors. Childers Mfg. Co., Houston, Tex.
Elm—Dampers. Elgo Shutter & Mfg. Co., Detroit, Mich.
Elno—Electrolytic devices for preventing corrosion. Patrol Valve Co., The, Cleveland, O.
Emd-Com—Blowers. Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Emline—Tank linings. Emjay Maintenance Engineers, Rutherford, N. J.
Empire—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Empire Mallets—Tools. Greene, Tweed & Co., North Wales, Pa.
Enamelite—Coatings. Presstite Div., American Marietta Co., St. Louis, Mo.
Enco—Burners, registers, fueloil units. Engineer Co., New York, N. Y.
Endcor—Water treatment. Dearborn Chemical Co., Chicago, Ill.
Endo—Air dampers. Elgo Shutter & Mfg. Co., Detroit, Mich.
Enduro—Hose. Continental Rubber Wks., Erie, Pa.
Enduro—Steel tubing, pipe. Republic Steel Corp., Cleveland, O.
Enduro Block—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Enduro#300—Unions. Jefferson Union Co., Inc., Lexington, Mass.
Epco—Grilles. Erdle Perforating Co., Rochester, N. Y.
Epoxy—Protective coatings. Gates Engineering Co., Wilmington, Del.
Equalizer—Deaerators, feeders, systems, traps. Acker Corp., Meridian, Miss.
Equa-Trol—Valves, manifolds and headers. Panel Heat, Inc., Copiague, N. Y.
Equavalve—Pipe fittings & Valves. Panel Heat, Inc., Copiague, N. Y.
Eraydo—Zinc sheets. Illinois Zinc Co., Div. of Hydrometals, Inc., Chicago, Ill.
Ermeto—Steel tube fittings. Imperial Brass Mfg. Co., Chicago, Ill.
Ermeto—Fittings. Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Esco—Fittings, flanges, nipples, pipe, exchangers. Electric Steel Foundry Co., Portland, Ore.
Esco Spuncast—Pipe, tubing. Electric Steel Foundry Co., Portland, Ore.
Esco Spuncast—Pipe, tubing. Electric Steel Foundry Co., Portland, Ore.
Escon—Electrical relays. Electro-Switch & Controls, Inc., Culver City, Calif.
Esso—Heaters, unitary air conditioners. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Esso Bond—Refractories. Ramtite Co., The, Chicago, Ill.
Eternium—Protective coatings. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Eutec-Arc—Arc welders. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecBor—Gas welding rods. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutechrom—Welding electrodes, gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
EuteCushion-Shim—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutec Rod—Rods, solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecSol—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutec-Tin-Weld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutectofilm—Gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutecto-Mask—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutector Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecTorch—Torches, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecTrode—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
EVACTOR—Heaters and pumps. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Evanaction—Valves. Taylor Instrument Companies, Rochester, N. Y.
Evenflo—Air filters. Hadley Products Co., Inc., Marietta, O.
Everbrite—Paint. Warren Refining & Chemical Co., The, Cleveland, O.
Ever Clean Boiler Process—Compounds. North American Mogul Products Co., The, Cleveland, O.
Everglas—Water heaters. Hotstream Heater Co., Cleveland, O.
Everjet—Coatings. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Ever Ready—Holders and files. Geneva Mfg. Co., South Elgin, Ill.
Evolene—Treatment. Berna Corp., Garwood, N. J.
Exbrook—Boilers. American-Standard Plumbing & Heating Div., New York, N. Y.
Excel 250#—Unions. Jefferson Union Co., Inc., Lexington, Mass.
ExFlux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Exhaust-O-Vent—Exhaust fittings. Engwald Corp., The, Inwood, Long Island, N. Y.
Exon—Plastics, powders and resins. Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Expand-R-Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Expelsor—Ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Explosimeter—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
External—Water heaters. Taco Heaters, Inc., Cranston, R. I.
Extra Dry Esotoo—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Eye-Hye—Indicators. Reliance Gauge Column Co., Cleveland, O.
Ezkleen—Filters. Research Products Corp., Madison, Wis.
Ezy-Kleen—Strainers. Blackmer Pump Co., Grand Rapids, Mich.

F & E—Stokers, and incinerators. Flynn & Emrich Co., Baltimore, Md.
FS—Bellows. Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Fab-Ric—Connections. Cain Mfg. Inc., Birmingham, Ala.
Fabri-Flex—Bases and pads, absorbers, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
Fabrikated—Grilles, registers. Independent Register Co., Cleveland, O.
Faceweld—Electrodes. Lincoln Electric Co., The, Cleveland O.
Fairco Braze—Valves. Fairbanks Co., The, New York, N. Y.
Fanaire—Diffusers, registers. Auer Register Co., Cleveland, O.
Fandaire—Condensers, finned pipe, finned tubing, unitary air conditioners. F5 Air Conditioning Corp., Tulsa, Okla.
Fanjet—Systems. Muellermist Irrigation Co., Maywood, Ill.
Fanmix—Burners. Coppus Engineering Corp., Worcester, Mass.
Far-Air—Unitary air conditioners, filters, humidifiers. Farr Co., Los Angeles, Calif.
Farragut—Packing. Darcoid Co., Inc., New York, N. Y.
FasFill Convection—Connectors. Scully Signal Co., Melrose, Mass.
Fashion—Thermostats. White-Rodgers Co., St. Louis, Mo.
Faslite—Gas pilots. Scully Signal Co., Melrose, Mass.
Fastak—Adhesives. Cain Mfg. Inc., Birmingham, Ala.
Fast's—Couplings. Koppers Company, Inc., Metal Products Div., Baltimore, Md.
FauceHot—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Favorite—Ratchet wrenches. Greene, Tweed & Co., North Wales, Pa.
Featherfin—Heating and cooling surface, unit coolers. Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Featherweight—Unit heaters. Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Featherweight Champ—Pipe cutting and threading machines, pipe vise stands. Oster Mfg. Co., Wickliffe, O.
Federal—Filters for oil burners. Norwood Products Co., Div. of A. R. Wood Mfg. Co., Luverne, Minn.
Federal—Filters. Wood Mfg. Co., A. R., Luverne, Minn.
Feedrator—Chemical feeders. Fischer & Porter Co., Hatboro, Pa.
Fein—Pipe cutting machines, electric saws. Krieg, Inc., Victor J., New York, N. Y.
Fel-Pro—Gaskets, packing. Felt Products Mfg. Co., Skokie, Ill.
Felt Grip—Bases and pads, absorbers. Vibration Mountings, Inc., Corona, N. Y.
Fenn's Rotary—Ventilators. Waverly Heating Supply Co., Beverly, Mass.
Ferrenewo—Valves. Lunkenheimer Co., Cincinnati, O.
Ferro-Therm—Insulation. American Flange & Mfg. Co., Inc., New York, N. Y.
Ferroweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Ferulok—Fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Fiber-Aire—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Fibercast—Plastic pipe. Youngstown Sheet & Tube Co., Youngstown, O.
Fiberglas—Insulation. Owens-Corning Fiberglas Corp., New York, N. Y.
Fiber Glass—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Fiber Glass—Insulation. Johns-Manville, New York, N. Y.

Fiberlite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
Fibrocel—Pipe insulation. Johns-Manville, New York, N. Y.
Fieldlink—Fittings. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Filtaire—Air filters. Morrison Products, Inc., Cleveland, O.
Filterdown—Filters. American Air Filter Co., Inc., Louisville, Ky.
Fil-Thru—Gages. Applied Mechanics Co., Boston, Mass.
Filtr-Aire—Filters. Peden Equipment Co., Houston, Tex.
Filtrex—Filters. Drico Industrial Corp., Passaic, N. J.
Fine-Line—Baseboard radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Fin-Flex—Registers. Auer Register Co., Cleveland, O.
Finger Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Finnflex—Bases, hangers. Finn & Co., Inc., T. R., Hawthorne, N. J.
Fin Ray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Fin Vector—Radiation. Dunham-Bush, Inc., West Hartford, Conn.
Fire-Chex—Vapor barriers. Carey Mfg. Co., Philip, Cincinnati, O.
Firecrete—Refractories. Johns-Manville, New York, N. Y.
Firefoil—Insulating panel. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Fire Fybr Felt—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Fireite—Furnace cement, refractories. Johns-Manville, New York, N. Y.
Fire Jet—Stokers. Electric Furnace-Man, Inc., Emmaus, Pa.
Fireye—Alarms, flame failure controls, recorders, combustion control systems, indicators, recorder-controllers, valves. Electronics Corp. of America, Cambridge, Mass.
Firite—Stokers. Hoffman Combustion Engineering Co., Lincoln Park, Mich.
Firma—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Firomatic—Filters, links, switches, valves. Morse-Smith-Morse, Inc., Watertown, Mass.
Fit-All—Pipe hangers and supports. Western Wire Products Co., St. Louis, Mo.
Fitrite—Tools, roof ventilators. Levow, Inc., David, South Hackensack, N. J.
Fixt-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Flametrol—Controls. Barber-Colman Co., Rockford, Ill.
Flame-O-Matic—Flame failure controls. Instruments, Inc., Tulsa, Okla.
Flange-Jacks—Separators. Williams & Co., J. H., Buffalo, N. Y.
Flat-Belt—Pulleys and sheaves. The American Pulley Co., Philadelphia, Pa.
Flaw-Findr—Dye penetrant. Met-L-Chek Co., Los Angeles, Calif.
Flax Foam—Pipe and tubing insulation. Delaware Insulation Co., Wilmington, Del.
Fleet Line—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Fleetweld—Welding electrodes. Lincoln Electric Co., Cleveland, O.
Flex—Hose. Flexaust Co., New York, N. Y.
Flex—Nipples. Techniflex Div., Port Jervis, N. Y.
Flexarc—Arc Welders. Westinghouse Electric Corp., Pittsburgh, Pa.
Flexazone—Unitary air conditioners. National-U.S. Radiator Corp., Johnstown, Pa.
Flexazone—Unitary air conditioners. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Flexcell—Bases and pads. Celotex Corp., The, Chicago, Ill.
Flexfast—Hose clamps. Flexible Tubing Corp., Guilford, Conn.
Flexfelt—Insulation. National Gypsum Co., Buffalo, N. Y.
Flexflyte—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.
Flex-Hose—Flexible hose. Korfund Co., Inc., Long Island City, N. Y.
Flexiblac—Protective coatings. Samuel Cabot, Inc., Boston, Mass.
Flexibond—Protective coatings. Continental Products Co., Euclid, O.
Flexi-Duct—Connections. Grant Wilson, Inc., Chicago, Ill.
Flexidur—Nozzles. Bahnson Co., Winston-Salem, N. C.
Flexidyne—Couplings, drives. Dodge Mfg. Corp., Mishawaka, Ind.
Flexiflo—Diffusers. Universal Diffuser Corp., Tuckahoe, N. Y.
Flexifoam—Insulation. Foamade Industries, Oak Park, Mich.
Flex-I-liner—Rotary pumps. Vanton Pump & Equipment Corp., Hillside, N. J.
Flexipipe—Tubing. Bemis Bro. Bag Co., St. Louis, Mo.
Flexloc—Lock nuts. Standard Pressed Steel Co., Jenkintown, Pa.
FLEXODISC—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
FLEXOLEED—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York.
Flexon—Bellows, pipe hangers and supports, steel tubing, pipe joints, ducts and duct fittings. Flexonics Corp., Maywood, Ill.
Flexon Expansion Compensator—Pipe joints. Flexonics Corp., Maywood, Ill.
Flexpansion—Fittings and hose. Techniflex Div., Port Jervis, N. Y.
Flexpipe—Absorbers. American Metal Hose Div., American Brass Co., The, Waterbury, Conn.
Flex Plates—Bases and pads, absorbers, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
Flex-Seal—Pumps. Bart Mfg. Corp., Belleville, N. J.
Flex-sulation—Insulation. Grant Wilson, Inc., Chicago, Ill.
Flextan—Packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Flex-Tube—Analyzers, gages, kits, meters, testers, manometers, switches, pilot tubes. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Flex Valve—Valves. Farris Flexible Valve Corp., **Palisades Park, N. J.**
Flexzorber—Hose. Finn & Company, Inc., T. R., Hawthorne, N. J.
Flex-Zorber—Adsorbers. Saussé & Co., M.W., Los Angeles, Calif.
Flikit—Ratchet wrenches. Custanite Corp., Brooklyn, N. Y.
Flite-Flo—Conveyors. Link-Belt Co., Chicago, Ill.
Flo—Dehydrant and acid neutralizer, for refrigerating systems. Allin Mfg. Co., Chicago, Ill.
Float-O-Matic—Pumps. March Mfg. Co., Inc., Skokie, Ill.
Floatrol—Switches, regulators. Automatic Control Co., St. Paul, Minn.
Flochek—Valves. Taco Heaters, Inc., Cranston, R. I.
Flo-Coater—Booths. Griffin & Co., Louisville, Ky.
Flocold—Unit coolers. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Floguide—Flow meters. Fischer & Porter Co., Hatboro, Pa.
Flo-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.
Floline—Tubing. Nylon Molding Corp., Garwood, N. J.
Flo-Line—Valves. Hanna Engineering Wks., Chicago, Ill.
Flo-Master—Louvers and shutters. Acme Engineering & Mfg. Corp., Muskogee, Okla.
Flo-Matic—Conveyors, stokers. American Coal Burner and Wood Stoker Corp., Chicago.
Floor-Level—Radiation. Rempe Co., Chicago.
Floorline—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Flo-Pilot—Valves. Hanna Engineering Wks., Chicago, Ill.
Floret—Meters. Bacharach Industrial Instrument Co., Pittsburgh, Pa
Florite—Air velocity meters, and anemometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Florite Desiccant—Dehumidifiers, dehydrators. Floridin Co., Tallahassee, Fla.
Flo-Scope—Meters. Selas Corp. of America, Dresher, Pa.
Flo-Set—Valves. Hanna Engineering Wks., Chicago, Ill.
Flotectic Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Flo-Tee—Fittings. Panel Heat, Inc., Copiague, N. Y.
Flotrol—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.
Flo-Tube—Conveyors. Canton Stoker Corp., Canton, O.
Flo-watch—Flow meters. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Floway—Turbine pumps. **Fiese & Firstenberger Mfg., Inc., Fresno, Calif.**
Flow-Cold—Water chillers, compressors, coolers and towers. Acme Industries, Inc., **Jackson, Mich.**
Flowmaster—Pumps. Marco Development Co., Inc., Wilmington, Del.
Flow-Mizer—Cooling towers, condensers. Acme Industries, Inc., Jackson, Mich.
Flow-O-Larm—Flow switches. Instruments, Inc., Tulsa, Okla.
Flow-Pac—Chillers, compressors. Acme Industries, Inc, Jackson, Mich.
Flowrator—Meters, systems. Fischer & Porter Co., Hatboro, Pa.
Flowrite—Valves. Powers Regulator Co., Skokie, Ill.
Flow-Temp—Unitary air conditioners. Acme Industries, Inc., Jackson, Mich.
Flow-Therm—Chillers, compressors, coolers. Acme Industries, Inc., Jackson, Mich.
Flow-Tube—Meters. Foster Engineering Div., General Controls Co., Warwick, R. I.
Fluid Fortress—Fittings. Flodar Corp., Cleveland, O.
Fluid Joists—Coils. Fricke, Fred J., Albuquerque, N. M.
Fluidyne—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Fluid-Tite—Pipe, asbestos. Keasbey & Mattison Co., Ambler, Pa.
Fluoroflex—Tubing, lined pipe. Resistoflex Corp., Roseland, N. J.
Fluoroseal—Cement and compounds. Industrial Plastic Fabricators, Norwood, Mass.
Flush-Kleen—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Flux-'N-Solder—Solder. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Flux-Stik—Solder. Lake Chemical Co., Chicago, Ill.
Foamglas—Insulation. Pittsburgh Corning Corp., Pittsburgh, Pa.
Foamsil—Insulation. Pittsburgh Corning Corp., Pittsburgh, Pa.
Force-Flo—Unit heaters. Trane Co., The, LaCrosse, Wis.
Form-A-Gasket—Cement and compounds. Permatex Co., Inc., Long Island, N. Y.
Form-A-Jig—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Formet—Water treatment. Perolin Co., Inc., New York, N. Y.
Formula 59—Water treatment. Oakite Products, Inc., New York, N. Y.
Fosco—Water heaters. Schoedinger, Inc., F. **O., Columbus, O.**
4A Vichrome—Tank linings. Interchemical Corp., Finishes Div., Newark, N. J.
4-Star—Adhesive tape. Johns-Manville, New York, N. Y.
Fracto Crete—Refractories. Ramtite Co., The, Chicago, Ill.
Francite—Cement, refractories and refractory cement. France Refractories Co., J. H., Snow Shoe, Pa.
Francke—Flexible couplings. Waldron Corp., John, New Brunswick, N. J.
Franco-Therm—Cement, insulating. France Refractories Co., J. H., Snow Shoe, Pa.
Franset—Cement, refractories and refractory cement. France Refractories Co., J. H., **Snow Shoe, Pa.**
Franset with Super Bond—Cement, and refractories and refractory cement. France Refractories Co., J.H., Snow Shoe, Pa.
Free-Flow—Ventilators. Burt Mfg. Co., Akron, O.
Free-Flow—Air filters. Wickford Products, Inc., New York, N. Y.
Fre-Flow—Strainers. Fisher Governor, Marshalltown, Ia.
Free-Vane—Controls. Bristol Co., The, Waterbury, Conn.
Frigid Arc—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Frigistat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Frogalloy—Electrodes. McKay Co., Pittsburgh, Pa.
Frost-Tite—Fittings. Remco, Inc., Zelienople, Pa.
Fuelguard—Regulators. Ashcraft Co., J. P., Dallas, Tex
Fuel-Rite — Treatment. Gotham Refining Chemical Co., New York, N. Y.
Fuel Saver—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Fuelsaver—Controls, regulators. Walker Mfg. & Sales Co., St. Joseph, Mo.
Fueltone X-10—Fuel oil treatment. Ampion Corp., Long Island City, N. Y.
Fuel-tron—Fuel oil treatment. Radiator Specialty Co., Charlotte, N. C.
Fulflo—Filters. Commercial Filters Corp., Melrose, Mass.
Fulgrip—Pulleys and sheaves. Maurey Mfg. Corp., Chicago, Ill.
Full Flow—Magnetic traps. Ladish Co., Tri-Clover Div., Kenosha, Wis.
Fulljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Full-view—Meters. Brooks Rotameter Co., Lansdale, Pa.
Fulscope—Recorders, recorder-controllers, regulators. Taylor Instrument Companies, Rochester, N Y
Fusionbrazed—Steel tubing. Avon Tube Div., Higbie Mfg. Co., Rochester, Mich.
Fusionweld—Tubing. Avon Tube Div., Highbie Mfg. Co., Rochester, Mich.
Fybr-Tech—Gaskets and sheets. Technical Ply-Woods Sales, Chicago, Ill.
Fyr-Feeder—Stokers, burners. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Fyrite—Analyzers, combustion testing kits. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

GAC—Baseboard radiation. General Alliance Corp., San Diego, Calif.
G-B Duct—Ducts and duct fittings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
G-B Snap-On—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
G-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., Massillon, O.
GIL—Filters, regulators, valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.

GIL Governoret—Valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
G-K—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.
G-R—Aftercoolers, oil coolers, water chillers, exchangers. Griscom-Russell Co., Massillon, O.
GS—Anemometers, hygrometers, indicators, psychrometers, welding and cutting apparatus. General Scientific Equipment Co., Philadelphia, Pa.
GT—Shaft Seals. Greene, Tweed & Co., North Wales, Pa.
G.T.D.—Masonry drills. Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Gaco—Pipe fittings, hard rubber pipe. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene & Rubber—Valves, coatings, fittings, tank linings, pipe. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene Vinyl—Coatings. Gates Engineering Co., Wilmington, Del.
Gagetron — Regulators. Instruments, Inc., Tulsa, Okla.
Galbestos—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
Gallo—Gages. Barclay, Inc., Robert, Chicago, Ill.
Galongage—Gages. Applied Mechanics Co., Boston, Mass.
Galva-Lux—Enamels and lacquers. Acorn Refining Co., Cleveland, O.
Gascope—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Gask-O-Seal—Seals and gaskets. Parker Seal Co., Culver City, Calif.
Gas-O-Matic—Heaters. Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O.
Gas-Pak—Welding rod. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Gasweld—Torches, meters, valves, regulators, welding and cutting apparatus. General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill
Gat Fasteners—Clamps, fasteners, nuts and washers. Tinnerman Corp., George A., Cleveland, O.
Gearchem—Gear pumps. Eco Engineering Co., Newark, N. J.
Gear-Draulic—Trenching machines. Auburn Machine Works, Inc., Auburn, Neb.
Gearmotor—Gears, speed reducers and increasers. Link-Belt Co., Chicago, Ill.
GearMotoRs—Gears. Philadelphia Gear Corp., Philadelphia, Pa.
Gel-Kote—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Gemco—Bolts, clamps, hangers and supports, nuts and washers, fasteners. Goodloe E. Moore, Inc., Danville, Ill.
Gem Foam—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Gemware—Hygrometers, psychrometers, thermometers, recorders, switches. G. M. Mfg. Co., New York, N. Y.
Genetron—Refrigerants. General Chemical Div., Allied Chemical Corp., New York, N Y.
Gentile—Meters. Foster Engineering Div., General Controls Co., Warwick, R. I.
Genuine Stillson—Wrenches. Walworth Co., New York, N. Y.
Geometric—Chasers. Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Geon—Plastics. Goodrich Chemical Co., B. F. Cleveland, O.
Geophone—Leak detectors. Globe Phone Mfg. Co., Reading, Mass.
Gilbarco—Unitary air conditioners, oil burners, heaters, pumps. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilmer—V-belts, v-belt drives. New York Belting & Packing Co., Passaic, N. J.
Gilsonite—Protective coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.
Gilsulate—Underground pipe insulation. American Gilsonite Co., Salt Lake City, Utah.
Gilt Edge—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Glasfloss—Filters. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Glassheat—Electric heating panels. Continental Radiant Glass Heating Corp., New York, N. Y.
Glider—Catalog holders and files. Momar Industries, Inc., Chicago, Ill.
Glid-Rez—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Globe—Fire extinguishing systems. Fyr-Fyter Co., Dayton, O.
Glo Tech—Glass pipe. Fischer & Porter Co., Hatboro, Pa.
Glowan—Gas burners. Martin Co., Inc., J. O., San Francisco, Calif.
Goetze—Gaskets. Johns-Manville, New York, N Y.
Gold Bond Therm-Bloc—Insulation. National Gypsum Co., Buffalo, N. Y.
Golden Bantam—Valves. Henry Valve Co., Melrose Park, Ill.
Golden Fleece—Building insulation. Carney Co., Inc., The, Mankato, Minn.
Gothcide—Water treatment. Gotham Refining Chemical Co., New York, N. Y.
Grad-U-Motor—Damper operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradustat—Regulators, thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradutrol—Diaphragm valves, radiator orifices. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Grafitex—Sleeve bearings. Gatke Corp., Chicago, Ill.
Graham—Valves. Texsteam Corp., Houston, Tex
Granco—Meters, pumps, strainers. Granberg Corp., Oakland, Calif.
Grand Rapids—Boiler vacuum cleaners. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Granodine——Protective coatings. Amchem Products, Inc., Ambler, Pa.
Granodraw—Protective coatings. Amchem Products, Inc., Ambler, Pa.
Graph-O-Matic—Panel boards. Powers Regulator Co., Skokie, Ill.
Graylite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Greastop—Air filters. Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Great Seal—Gaskets, packing, tape, valves. New York Belting & Packing Co., Passaic, N. J.
Greyhound—Welders. Duro-Dyne Corp., Farmingdale, L. I., N. Y.
Grid—Finned surfaces, radiation, unit heaters, humidifiers. Murray Mfg. Co., D. J., Wausau, Wis.
Griptube—Fittings. Flodar Corp., Cleveland.
Gripzins—Expansion bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Gritseald—Rotary pumps. St. Louis Tool Co., St. Louis, Mo.
Gruvagrip—Couplings, fittings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Gruvajoint—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Guardian—Oil tank gages. Applied Mechanics Co., Boston, Mass.
Guillotine—Cutters, pipe cutting and threading machines, saws. Wachs Co., E. H., The, Chicago, Ill.
Gum-Bestos—Tape. Grant Wilson, Inc., Chicago, Ill.
Gunchrome—Refractories and refractory cement. Basic Inc., Cleveland, O.
Gundol—Refractories and refractory cement. Basic Inc., Cleveland, O.
Gunk—Cleaning compounds. Radiator Specialty Co., Charlotte, N. C.
Gun Mag—Refractories and refractory cement Basic Inc., Cleveland, O
Gun Mix—Refractories and refractory cement. Basic Inc., Cleveland, O
Gusher—Pumps. Ruthman Machinery Co., Cincinnati, O.
Gyro Mass Meter—Meters. Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Gyrol—Drives. American-Standard Industrial Div., Detroit, Mich.
Gyrol Fluid Drive—Speed changer. American-Standard Industrial Div., Detroit, Mich.

H & C—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
HH&HHV—Unitary air conditioners. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
HS — Fans. American-Standard Industrial Div., Detroit, Mich.
HSP—High pressure blowers. New York Blower Corp., Chicago, Ill.
HTH—Water treatment. Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
H-T-W Flo-Kontrold—Heating boilers. Boiler Engineering & Supply Co., Phoenixville, Pa.
HX-Changers—Heat exchangers. Rempe Co., Chicago, Ill.
Hallowell—Bearings. Standard Pressed Steel Co., Jenkintown, Pa.
Hally-Filters. Delavan Mfg. Co., West Des Moines, Ia.
Hammerkraft—Enamels and lacquers. Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Hammerlin—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Hamrflute—Drills. Star Expansion Industries Corp., Mountainville, N. Y.
Ham-R-Tool—Tools. Fastway Fasteners, Inc., Lorain, O.
Hamrtwist—Drills. Star Expansion Industries Corp., Mountainville, N. Y.
Hancock—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Handi-Can—Refrigerants. Pennsalt Chemicals Corp., Philadelphia, Pa.
Handi-Heet—Torches, refrigerant leak detectors. Smith Welding Equipment Corp., Minneapolis, Minn.
Handi-Rack—Storage racks. XXth Century Heating & Ventilating Co., The, Akron, O.
Hand O Matic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Handy—Valves. Allin Mfg. Co., Chicago, Ill.
Handy—Benders. Holsclaw Bros., Inc., Evansville, Ind.
Handy—Valves. Lunkenheimer Co., Cincinnati, O.
Handy Andy—Vise stands. Western Wire Products Co., St. Louis, Mo.
Handy-Flux—Solder. Handy & Harman, New York, N. Y.
Harco—Pipe fittings and pipe flanges. Harrison Steel Corp., Brooklyn, N. Y.
Hardalloy—Electrodes. McKay Co., Pittsburgh, Pa.
Harmeco—Filters, separators. Harman Equipment Co., Los Angeles, Calif.
Hastelloy—Nickel and nickel alloy pipe fittings, pipe coils, pipe flanges, pipe nipples, pipe sheets and tubing. Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
Haze-lok—Fittings, non-metal hose and fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Hazelton—Pumps, strainers, valves. Barrett Haentjens & Co., Hazleton, Pa.
Heath-Crete—Refractories. Quigley Co., Inc., New York, N. Y.
Hearth patch—Refractories and refractory cement. Basic Inc., Cleveland, O.
Heart-Oak—Belting. Graton & Knight Co., Worcester, Mass.
Heat-aid—Refractories. Pyrolite Products Co., Cleveland, O.
Heat-Cel—Hot gas defrosting systems. Dole Refrigerating Co., Chicago, Ill.
Heatcote—High temperature paint. Debevoise Co., The, Brooklyn, N. Y.
HeatEjector—Heat exchangers. Degree Corp., Kansas City, Kans.
Heatflex—Cables, heaters. S&C Mfg. Co., Cincinnati, O.
Heat-Hog—Coolers. Heatron, Inc., York, Pa.
Heatmaster—Heaters. Coleman Co., Inc., The, Wichita, Kans.
Heat-Pak—Boilers. heaters. Aldrich Co., The, Wyoming, Ill.
Heat-Rem—Paint for hot surfaces. Speco, Inc., Cleveland, O.
Heat-Rem H-170—Paint for hot surfaces. Speco, Inc., Cleveland, O.
Heatrim—Radiation. American-Standard Plumbing & Heating Div., New York, N. Y.
Heat-Rite—Registers. Auer Register Co., Cleveland, O.
Heatsum—Electric heating panels, cable. Roberson Inc., Seattle, Wash.
Heat-Valve—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Heat Wagon—Heaters. Lennox Industries, Inc., Marshalltown, Ia.
Heat-X-It—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Heavy Duty—Torches, welding and cutting apparatus. Smith Welding Equipment Corp., Minneapolis, Minn.
Heavy Duty—Pipe cutters. Erie Tool Works, Erie, Pa.
Heavy Duty—Pipe wrenches. Ridge Tool Co., Elyria, O.
Heetaires—Electric heating panels, radiation, heaters. LaSalle Products, Inc., Buffalo, N. Y.
Heilex—Tanks. Heil Process Equipment Corp., Cleveland, O.
Heliarc—Arc welding electrodes. arc welders. Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Heliflow—Aftercoolers, chillers, oil coolers, heat exchangers, water heaters. Graham Mfg. Co., Inc., Great Neck, Long Island, N. Y.
Helitork—Valve operators. Earle Gear & Machine Co., Philadelphia, Pa.
Hellite—Refractories. Johns-Manville, New York, N. Y.
Hercules—Floats. Henry Owens & Co., Inc., Cranston, R. I.
Herculite—Tanks. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Herculoy—Tubing. Revere Copper and Brass, Inc., New York, N. Y.
Herecrol—Protective coatings, tank linings, enamels and lacquers, lined pipe. Heresite & Chemical Co., Manitowoc, Wis.
Hermetic Eye—Sight glasses for pipe lines. Superior Valve & Fittings Co., Pittsburgh, Pa.
HerNel-Cool—Unit ventilators. Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Hev-E-Duty — Burners. Industrial Combustion, Inc., Milwaukee, Wis.
Hev-E-Oil—Burners. Industrial Combustion, Inc., Milwaukee, Wis.
Hex-Changer—Heat exchangers. Drayer-Hanson, Division of National-U. S. Radiator Corp., Los Angeles, Calif.
Hi—Bolts, clamps, cleaners, drills, insulation fasteners, pipe hangers and supports, pipe reamers. Holub Industries, Inc., Sycamore, Ill.

Hi-Amp—Tools, pipe clamps. Lenco, Inc., Jackson, Mo.

Hi-Cap—Furnaces. Syncromatic Corp., Watertown, Wis.

Hi-Dri—Retrigerant Dehydrators. Wabash Corp., Chicago, Ill.

Hideaway—Unitary air conditioners. Burnham Corp., Irvington, N. Y.

Hideway—Cooling towers. Toungate & Coats, Austin, Tex.

Hi-Duty—Tubing cutters, valves, flaring tools. Imperial Brass Mfg. Co., Chicago.

Hi-Duty—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.

Hi-Ef—Filters, heads, separators. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.

Hi-Ex—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.

High Heat Aluminum—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.

High Heat Gray—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.

High - Ten - 500—Solder. Chemical Specialty Div., Shooz Polish Mfg. Co., Milwaukee, Wis.

Hi-Hopper—Coal and ash conveyors. New London Engineering Co., New London, Wis.

Hilco—Filters. Hillard Corp., Elmira, N. Y.

Hilger—Chillers, unit coolers, unitary air conditioners, valves. XL Refrigerating Co., Chicago, Ill.

Hi-Lift—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.

Hi-Line—Plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.

Hi-Recovery—Heaters. Quiet Automatic Oil Burner Corp., Newark, N. J.

Hi-Seal—Cement and compounds. Greene, Tweed & Co., North Wales, Pa.

Hi-Seal—Steel tube fittings. Imperial Brass Mfg. Co., Chicago, Ill.

Hi-Speed—Welding and cutting apparatus, torches. Dockson Corp., Detroit, Mich.

Hitchings—Boilers. Burnham Corp., Irvington, N. Y.

Hi - Temp—Insulation. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.

Hi-Temp—Insulation cement, refractories & refractory cement. Zonolite Co., Chicago, Ill.

Hi-Temp—Paint. Illinois Bronze Powder Co., Chicago, Ill.

Hi-Value—Adhesive tape. Johns-Manville, New York, N. Y.

Hoffman—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.

Hoffman—Draft controls. Salina Metal Products Co., Salina, Kan.

Hole-Shooter—Drills. Milwaukee Electric Tool Corp., Milwaukee, Wis.

Holgun—Drills. Black & Decker Mfg. Co., Towson, Md.

Hollo-Tech—Doors and panels. Technical Ply-Woods Sales, Chicago, Ill.

Holoflite—Dryers. Western Precipitation Corp., Los Angeles, Calif.

Holtite—Bolts, screws. Continental Screw Co., New Bedford, Mass.

Horton—Tanks. Chicago Bridge & Iron Co., Chicago, Ill.

Hot Shot—Unit coolers. Drayer-Hanson, Division of National-U. S. Radiator Corp., Los Angeles, Calif.

Hot Spot—Preheaters. Rempe Co., Chicago.

Hot Spot—Spot welders. Acme Electric Welder Co., Los Angeles, Calif.

Houghto-Clean—Boiler cleaning compounds. Houghton & Co., E. F., Philadelphia, Pa.

Hovalco—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.

Howlers—Alarms. Benjamin Electric Mfg. Co., Des Plaines, Ill.

Humiclean—Cleaning compounds, water treatment. Carolina Aniline & Extract Co., Charlotte, N. C.

Humidigraph—Humidistats, hygrometers, indicator-controllers. Bristol Co., Waterbury, Conn.

Humidiguide—Hygrometers. Talyor Instrument Companies, Rochester, N. Y.

Humidomist—Nozzles, humidifiers. Supreme Electric Products Corp., Rochester, N. Y.

Humidostat—Humidistats. Johnson Service Co., Milwaukee, Wis.

Humiduct—Unitary air conditioners. Bahnson Co., Winston-Salem, N. C.

Humid - U - Stat—Humidistats. Minneapolis-Honeywell Regulator Co., Minneapolis.

Humistat—Humidistats. American Instrument Co., Inc., Silver Spring, Md.

Humi-Temps—Unit air coolers. Larkin Coils, Inc., Atlanta, Ga.

Huron—Baseboard radiation. Farrell Associates Charles, Valencia, Pa.

Hush-A-Duct—Sound-absorbers. Korfund Co., Inc., Long Island City, N. Y.

HusHeater—Heaters. Sims Pump Valve Co., Hoboken, N. J.

Hyal—Refractories and refractory cement. Quigley Co., Inc., New York, N. Y.

Hydrafilter—Separators. Wade Mfg. Co., Elgin, Ill.

Hydra-Glide—Cooling towers. Mason Products, Inc., Woburn, Mass.

Hydramotor—Valves. General Controls Co., Glendale, Calif. and Skokie, Ill.

Hydra-Spray—Booths. Griffin & Co., Louisville, Ky.

Hydra-Tube—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.

Hydrecon—Combustion chambers. France Refractories, Co., J. H., Snow Shoe, Pa.

Hydrepair—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Hydro—Regulators. Duro-Dyne Corp., Farmingdale, L. I., N. Y.

Hydrocast—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati, O.

Hydro-Fin—Radiation. Hydrotherm, Inc., Northvale, N. J.

Hydro-Flo—Heaters, heating systems, circulators, regulators. Bell & Gossett Co., Morton Grove, Ill.

Hydro-Foam—Dust collectors. Mahon Co., R. C., Detroit, Mich.

Hydro-Foil—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.

Hydroguard—Valves. Powers Regulator Co., Skokie, Ill.

Hydro-Line—Pipe fittings, plastic pipe flanges, plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.

Hydroline—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.

Hydro-Lok—Regulators, valves. American Flow Control Corp., Houston, Tex.

Hydron—Bellows. Clifford Mfg. Co., Div. of Standard Thomson Corp., Waltham, Miss.

Hydro-Precipitator—Washers. Johnson-March Corp., Philadelphia, Pa.

Hydro-Ray—Baseboard radiation. Axeman-Anderson Co., Williamsport, Pa.

Hydrostatic—Connectors. Mechanical Products Corp., Chicago, Ill.

Hydrotex—Sleeve bearings. Gatke Corp., Chicago, Ill.

Hydro-Vectors—Air conditioning units. Hydrotherm, Inc., Northvale, N. J.

Hydro-Whirl—Dust collectors, spray booths. DeVilbiss Metal Fabricators Co., Detroit, Mich.

Hydryer—Dehumidifiers. Pritchard & Co. of California, J. F., Kansas City, Mo.

Hy-Duty—Blades, propeller fans. Schwitzer Corp., Indianapolis, Ind.

Hy-Gear—Clamps. Ideal Corp., Brooklyn, N. Y.

Hygro-Thermographs—Recorders. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.

Hy-Line—Unitary air conditioners. Baseline Mfg. Corp. of Fla., St. Petersburg, Fla.

Hypalon—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.

Hypalon—Protective coatings. Gates Engineering Co., Wilmington, Del.

Hyrate—Refractories. Plibrico Co., Chicago, Ill.

Hyro—Regulators. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.

Hy-Spar—Caulking and sealing compounds, enamels and lacquers. Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.

Hy-Temp—Cement, insulation. Keasbey & Mattison Co., Ambler, Pa.

Hytempite—Cement, refractories. Quigley Co., Inc., New York, N. Y.

Hy-Test—Heaters. Burnham Corp., Irvington, N. Y.

Hy-Test—Water heaters. Smith Co., Inc., H. B., The, Westfield, Mass.

Hy-Vent—Eliminators, valves. Taco Heaters, Inc., Cranston, R. I.

IMO—Pumps. De Laval Steam Turbine Co., Trenton, N. J.

INS—Torches. Lincoln Electric Co., The, Cleveland, O.

IRCO—Combustion chambers. Lindy Heaters, Inc., New York, N. Y.

IVCO—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

Ice-Cel—Accumulators, chillers. Dole Refrigeration Co., Chicago, Ill.

Ideal—Adhesives, insulation. Taft Jenkins Co., Inc., Holyoke, Mass.

Ideal—Tubing cutters, tube expanders. The Gustav Wiedeke Co., Dayton, O.

Ideal—Tools. Boston Machine Works, Co., Lynn, Mass.

Ideal—Traps. Nason Co., Clarkston, Mich.

Idealarc—Welders. The Lincoln Electric Co., Cleveland, O.

IllBronze—Paint. Illinois Bronze Powder Co., Chicago, Ill.

Illco-Matic—Valves. Illinois Water Treatment Co., Rockford, Ill.

Illco-Way—Water filters, water softeners, water treatment. Illinois Water Treatment Co., Rockford, Ill.

Immersatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.

Imperial—Unitary air conditioners. International Metal Products Co., Phoenix, Ariz.

Imperial—Heaters. Payne Company La Puente, Calif.

Impervite—Heads. Falls Industries, Inc., Solon, O.

Impervo—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Inco—Electrodes, flanges, pipe fittings, pipe, rod, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Inconel—Pipe, fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Inconel—Tubing. Trent Tube Co., East Troy, Wis.

Indeeco—Heaters, preheaters, pipe heating systems. Industrial Engineering & Equipment Co., St. Louis, Mo.

Indestructible—Gaskets. New York Belting & Packing Co., Passaic, N. J.

Indestructible—Valves. Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.

Indoor-Outdoor—Thermostats. White-Rodgers Co., St. Louis, Mo.

Industrial Air—Furnaces, heaters. Inland Heater Corp., St. Paul, Minn.

IngAclad—Clad sheets. Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.

In-Line—Reducers and increasers. Link-Belt Co., Chicago, Ill.

Ins-Lite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.

Inspecdor—Doors and panels. Zurn Industries, Inc., Erie, Pa.

Instant—Heaters, preheaters. Johnson Corp., The, Three Rivers, Mich.

Instant Arc—Arc welders. Marquette Mfg. Co., Inc., Minneapolis, Minn.

Instant Glo—Combustion chambers. Boston Machine Works Co., Lynn, Mass.

Instant-Hardner—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.

Instant-Vane Rail—Vanes. Cain Mfg. Inc., Birmingham, Ala.

InstOmatic—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

Inst-O-Verse—Electric motors. Franklin Electric Co., Inc., Bluffton, Ind.

Insulag—Insulation, cement. Quigley Co., Inc., New York, N. Y.

Insulation—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.

Insulbrix—Refractories. Quigley Co., Inc., New York, N. Y.

Insulcolor—Vapor barriers. Armstrong Cork Co., Lancaster, Pa.

Insulcrete—Refractories. Quigley Co., Inc., New York, N. Y.

Insulfil—Insulation. Miracle Adhesives Corp., Bellmore, N. Y.

Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.

Insulkote—Boiler and tank insulation. Johns-Manville, New York, N. Y.

Insul-Pin—Insulation fasteners, stud welders. Omark Industries, Inc., Portland, Ore.

Insul Pipe—Duct and duct fittings. Coleman Co., Inc., The, Wichita, Kans.

Insulseal—Adhesives. Adhesive Products Corp., New York, N. Y.

Insulseal—Protective coatings. Eagle-Picher Co., Cincinnati, O.

Insul-Stic—Adhesives. Eagle-Picher Co., Cincinnati, O.

Insultape—Pipe and tubing insulation. Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.

Integral Jet—Burners. Stout & Sons, David, St. Louis, Mo.

Intensarc—Electrodes. National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.

Interlocked—Packing. Johns-Manville, New York, N. Y.

Inter-Matic—Time switches. International Register Co., Chicago, Ill.

Interwoven—Packing. Greene, Tweed & Co., North Wales, Pa.

Intru-lok—Fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.

Invisaline—Electric heating panels, baseboard radiation. Arvin Industries, Inc., Columbus, Ind.

Ionaire—Ionization apparatus. Wesix Electric Heater Co., San Francisco, Calif.

Ionizers—Ionization apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

Irenew—Valves. Powell Co., Wm., The, Cincinnati, O.

Ironhide—Protective coatings. Pittsburgh Plate Glass Co., Pittsburgh, Pa.

Irontite—Water treatment. Salsbury Corp., Los Angeles, Calif.

Ironweld—Compounds. Sight Feed Generator Co., West Alexandria, O.

Irv-o-lite—Plastic tubing. Irvington Div., Minnesota Mining & Mfg. Co., Irvington, N. J.

Iso-Finish—Valves. Detroit Stamping Co., Detroit, Mich.
Isomode—Absorbers, bases and pads, vibration isolating. MB Electronics, New Haven, Conn.
Isotron—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Isotrons—Refrigerants. Pennsalt Chemicals Corp., Philadelphia, Pa.
Ivco—Roof ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

J & C—Burners, fans, furnaces, heaters. Jackson & Church Co., Saginaw, Mich.
JC 60—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.
J E—Valves. Jackes-Evans Mfg. Co., St. Louis, Mo.
J & H Customized—Motors. Jack & Heintz, Inc., Cleveland, O.
J & L—Tubing. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
J-M—Bases and pads, cement, tape. Johns-Manville, New York, N. Y.
J M Ball—Traps. Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
JPS—Bearings. Link-Belt Co., Chicago, Ill.
J-W Gas-Pointer—Leak detectors. Johnson-Williams Inc., Palo Alto, Calif.
J-W Sentinel—Alarms. Johnson-Williams, Inc., Palo Alto, Calif.
J-W Sniffer—Leak testers. Johnson-Williams, Inc., Palo Alto, Calif.
Jal-Con-Weld—Steel pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Jal Duct—Pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Jal-Jacket—Lined pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Jal Zinc—Sheets. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Janitrol—Boilers, burners, heaters, furnaces, unitary air conditioners. Surface Combustion Corp., Toledo, O.
Jarene 8—Tubing Jarrow Products, Inc., Chicago, Ill.
Jeep-A-Trench—Trenching machines. Auburn Machine Works, Inc., Auburn, Neb.
Jennings—Ejectors. Nash Engineering Co., South Norwalk, Conn.
Jet Axial—Ventilators. Detroit Blower Corp., Franklin Park, Ill.
Jetglas—Heaters. Day & Night Mfg. Co., La Puente, Calif.
Jet-Hard—Electrodes. The Lincoln Electric Co., Cleveland, O.
Jet-Heat—Burners. Barber Mfg. Co., Cleveland, O.
Jet-Ignition—Industrial stokers. Babcock & Wilcox Co., The, Boiler Div., New York, N. Y.
Jet-Line—Combustion chambers. Grant Wilson, Inc., Chicago, Ill.
Jetolators—Vent flue caps, roof ventilators. Accurate Sheet Metal & Mfg. Wks., Inc., Chicago, Ill.
Jet Power—Gas burners. Auburn Burner Co., Edgerton, O.
Jet Series—Torches, welding and cutting apparatus. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Jet Tube—Systems. McQuay, Inc., Minneapolis, Minn.
Jetweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Jiffy—Regulators. Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Jiffy Clips—Hangers and supports. Minerallac Electric Co., Chicago, Ill.
Jiffy Dampers—Dampers. Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
John Crane—Boiler tube expanders, gaskets, seals, packing. Crane Packing Co., Morton Grove, Ill.
Johnson—Boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Jointite—Cement and compounds. Arco Co., The, Cleveland, O.
Joint Seal—Cement. Armite Laboratories, Los Angeles, Calif.
Jomanco—Tape. Johns-Manville, New York, N. Y.
Jorgensen—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.
Jubilee—Non-metal hose. New York Belting & Packing Co., Passaic, N. J.
June-Aire—Heating and ventilating systems. American Foundry & Furnace Co., Bloomington, Ill.
Junior—Radiation. Weil-McLain Co., Michigan City, Ind.
Junior—Ventilators. Octagon Ventilator Co., Chicago, Ill.

K—Fittings and flanges, repair plugs for pipe. Kuhns Brothers Co., Dayton, O.
KAB Kool—Unitary air conditioners. Metal Products Engr., Inc., Los Angeles, Calif.
K. A. T.—Compounds and water treatment. American K.A.T. Corp., Subsidiary of Magnus Chemical Co., Inc., Garwood, N. J.
K-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., Massillon, O.
K-Louver—Sun reflecting louvers. Kawneer Co., Niles, Mich
K & M—Pipe. Keasbey & Mattison Co., Ambler, Pa.
K and M—Controls, feeders, governors, indicator-controller, regulators, valve operators, strainers, traps valves. Kieley & Mueller, Inc., Middletown, N. Y.
K-Master—Filters, eleminators, separators, traps. Kaye & MacDonald, Inc., West Orange, N. J.
K-Matic—Electric and pneumatic drills. Gardner-Denver Co., Quincy, Ill.
K-Shield—Boiler and pipe insulation. Robinson Industries, Coleman, Mich.
KX-99—Refractories and refractory cement. Green Fire Brick Co., A.P., Mexico, Mo.
Kab Kooler—Unitary air conditioners. Onan & Sons Inc., D. W., Minneapolis Minn.
Kable Kord—Belting. New York Belting & Packing Co., Passaic, N. J.
Kamlok—Couplings, fittings. OPW-Jordan, Cincinnati, O.
Kango—Electric hammers. Porter-Cable Machine Co., Syracuse, N. Y.
Kantleak—Pipe couplings, filters, pipe fittings, pipe nipples, valves. Anderson Brass Co., Detroit, Mich.
Kane—Boilers. Mears-Kane-Ofeldt, Inc., Div S. T. Johnson Co., Bridgeport, Pa.
Kant-twist—Pipe welding clamps. Custanite Corp., Brooklyn, N. Y.
Kaocast—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N Y
Kaocrete—Refractories and refractory cement Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Kaolight—Refractories and refractory cement Babcock & Wilcox Co., Boiler Div., New York N Y
Kaowool—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N Y
Karbate—Carbon pipe, heat exchangers, heaters, pumps. National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
Karbonite—Destroyers. Anderson Chemical Co., Inc., Macon, Ga.
Kast-O-Lite—Refractories & refractory cement. Green Fire Brick Co., A.P., Mexico, Mo.
Kast-Set—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Kathabar—Dehumidifiers, unitary air conditioners, humidifiers, air washers. Surface Combustion Corp., Toledo, O.
Kaukit—Caulking and sealing compounds. Sonneborn Sons, Inc., L., Building Products Div., New York, N.Y.
Kaylo—Insulation Owens-Corning Fiberglas Corp., New York, N. Y.
KaytherM—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Kearsarge—Packing, gaskets. Johns-Manville, New York, N Y.
Kek—Compounds, steam and water treatments. Kenite Laboratory, Madison, N J.
Kelvinator—Electric plug-in dehumidifiers. Ebco Mfg. Co., Columbus, O.
Kemaloid—Water treatment compounds, boiler cleaning compounds. McMillan Industrial Supplies, C. C., Portland, Ore.
Kem Cati-Coat—Enamels and lacquers. Sherwin-Williams Co., The, Cleveland, O.
Kem Lustral—Enamels and lacquers. Sherwin-Williams Co., The, Cleveland, O.
Ken—Combustion chambers, fittings & bushings. Barclay, Inc., Robert, Chicago, Ill.
Kenbric—Soot destroyers. Kenite Laboratory, Madison, N J.
Kennison—Nozzles. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Kens—Nuts and washers. Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Keystone—Packaged steam boiler units. Erie City Iron Wks., Erie, Pa.
Keystone—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Kidskin—Packing. Darcoid Co., Inc., New York, N. Y.
Kindorf—Bolts, hangers and supports, inserts, racks. Steel City Electric Co., Pittsburgh, Pa.
Kinepack—Burners. Webster Engineering Co., Tulsa, Okla.
Kinetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
King—Gages. Oil Equipment Mfg. Corp., New Haven, Conn.
King-clip—Valves. Lunkenheimer Co., Cincinnati, O.
King Fill—Alarms. Oil Equipment Mfg. Corp. New Haven, Conn.
King-Kool—Fans, propeller. Belco Industries, Inc., St Louis, Mo.
King of Scot—Boilers. National-U. S. Radiator Corp., Johnstown, Pa.
Kleen Air—Filters. Kaye & MacDonald, Inc., West Orange, N. J.
Kleenaire—Ventilators. Hudson Mfg. Co., H.D., Chicago, Ill.
Kleenflo—Unit air filters. Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., Cleveland, O.
Kleen Koil—Boiler cleaning compounds. Clayton Mfg. Co., El Monte, Calif.
Klero—Packing. Greene, Tweed & Co., North Wales, Pa
Kling Felt—Gaskets, tape. Products Research Co., Los Angeles, Calif.
Klip-Kupl—Pipe fittings. American Flow Control Corp., Houston, Tex.
Klixon—Regulators, relays, thermostats. Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
Klondike—Arc welders, pipe thawers. Fern, Ralph, Scranton, Pa.
Kno-Draft—Air diffusers, grilles, registers, sound and volume control units. Conner Engineering Corp., Danbury, Conn.
Kold Board—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Kold Wave—Condensers. Heat-Exchangers, Inc., Chicago, Ill.
Koncentrix—Fittings. Special Screw Products, Bedford, O.
Kontrol Motor—Diaphragm valves. Kieley & Mueller, Inc., North Bergen, N. J.
Kooler-Aire—Condensers, unitary air conditioners. United States Air Conditioning Corp., Delaware, O.
Kool-Shade—Solar heat resisting screens. Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Kool-Temp—Unitary air conditioners. Midwest Air Conditioning Co., Des Moines, Ia.
Kopr-Kote—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.
Korda—Gaskets. Chicago Gasket Co., Chicago, Ill
Korduct—Underground piping conduits. Johns-Manville, New York, N. Y.
Kor-It—Drills. Hamlin Co., Inc., J. F., San Francisco, Calif.
Korner-King—Tools. R C S Tool Corp., Bloomington, Ill.
Koroseal—Tank linings; plastic pipe; plastic tubing; plastic sheets; pipe couplings; ducts and duct fittings; pipe fittings; gaskets. Goodrich Industrial Products Co., B. F., Akron, O.
Koroseal—Conduit, pipe couplings, fittings, plastic pipe, plastic sheets, plastic tubing, plastic valves. Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O.
Krome Kote—Coatings. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Kromik—Coatings. Sherwin-Williams Co., The, Cleveland, O.
Kromover—Compounds. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Kruzite—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Kuchler-Huhn—Shaft seals. Koppers Co., Inc., Metals Products Div., Baltimore, Md.
Kwick-Kupling—Couplings, joints. American Flow Control Corp., Houston, Tex.
Kwikflux—Solder. Special Chemicals Corp., Ossining, N. Y.
Kwik-Kleen—Compounds, scale removal, treatment. North American Mogul Products Co., The, Cleveland, O.
Kwik-way—Regulators. Hart & Cooley Mfg. Co., Holland, Mich.
Kwik-Steam—Boilers. Littleford Bros., Inc., Cincinnati, O.
Kwiky-Dots—Industrial adhesive tape. By-Buk Co., Los Angeles, Calif.

L. A. Line—Motors. Louis Allis Co., The, Milwaukee, Wis.
L & H—Heaters. Thermador Electrical Mfg., Los Angeles, Calif.
LJ-1—Torches. Lincoln Electric Co., The, Cleveland, O.
L & N—Indicators. Leeds & Northrup Co., Philadelphia, Pa.
La-Co—Solder and fluxes. Lake Chemical Co., Chicago, Ill.
Lagfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.
Lagtone—Adhesives, for pipe covering. Foster Co., Benjamin, Philadelphia, Pa.
Laminair-Flo—Ducts and duct fittings. United Sheet Metal Co., Inc., Columbus, O.
LaMont—High temperature water boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Landmaco—Pipe cutting machines. Landis Machine Co., Waynesboro, Pa.
Landmark—Unitary air conditioners. Lennox Industries, Inc., Marshalltown, Ia.
Lanhydro—Pipe cutting machines. Landis Machine Co., Waynesboro, Pa.
Larm-Tector—Alarms. Way-Wolff Associates, Inc., Long Island City, N. Y.
Lasco—Insulation, plastic pipe. Lynch Asbestos Co., Los Angeles, Calif.
Lattice-Braid—Packing. Garlock Packing Co., The, Palmyra, N. Y.
L Blow—Ventilators. Romla Co., Los Angeles, Calif.

Leader—Stocks and dies. Oster Mfg. Co., Wickliffe, O.
Leader—Water heaters. Day & Night Mfg. Co., La Puente, Calif.
Leadtex—Sheets. Revere Copper & Brass, Inc., New York, N. Y.
Leak Lock—Cement and compounds. Highside Chemicals Inc., Clifton, N. J.
Leak-Tec—Leak testers, and detectors. American Gas & Chemicals, Inc., New York.
Lectric-Aire—Air filters. Radex Corp., Chicago, Ill.
Lectro-Clad—Protective coatings, fittings, pipe, pipe flanges, tank linings, pipe nipples, sheets. Bart Mfg. Inc., Belleville, N. J.
Lectrodryer—Dehumidifiers. Pittsburgh Lectrodryer Div., McGraw-Edison Co., Pittsburgh, Pa.
Lectrofilter—Air filters. Coolerator Div., McGraw-Edison Co., Albion, Mich.
Led-Plate—Cement and compounds, lubricants. Armite Laboratories, Los Angeles, Calif.
Ledaloyl—Sleeve bearings. Johnson Bronze Co., New Castle, Pa.
Le-Hi—Hose and tubing clamps, hose to pipe fittings. Hose Accessories Co., Philadelphia, Pa.
Leigh—Roof ventilators. Air Control Products, Inc., Coopersville, Mich.
Leigh Imperial—Metal canopies. Air Control Products, Inc., Coopersville, Mich.
Lekro-Tektor—Electrolytic devices. Marlo Coil Co., St. Louis, Mo.
Lektrik-Air—Ventilators. Hudson Mfg. Co., H.D., Chicago, Ill.
Lektroneal—Tubing. Reading Tube Corp., New York, N. Y.
Lektroseal—Tubing. Reading Tube Corp., New York, N. Y.
Len-Lox—Ducts and Duct Fittings. Lennox Industries, Inc., Marshalltown, Ia.
Lert-A-Larm—Fire extinguishing systems. Miller-Harris Instrument Co., Milwaukee, Wis.
Letheray—Sterilizing air units. Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.
Levalarm—Alarms, cut-offs. Reliance Gauge Column Co., Cleveland, O.
Level Eye—Gages, indicators. Phillips & Co., H. A., Chicago, Ill.
Level-Master—Regulators. Sporlan Valve Co., St. Louis, Mo.
Levelometer—Gages. Liquidometer Corp., Long Island City, N. Y.
Levelrator—Indicators, alarms, recorders, regulators, switches. Fischer & Porter Co., Hatboro, Pa.
Level-Rite—Vibration isolating bases. Felters Co., The, Boston, Mass.
Level-Trol—Regulators. Fisher Governor Co., Marshalltown, Ia.
Leveltronic—Alarms. Instruments, Inc., Tulsa, Okla.
Lexan—Plastics, powders and resins. General Electric Co., Chemical Materials Dept., Pittsfield, Mass.
Liberty—Hose. Continental Rubber Wks., Erie, Pa.
Liberty—Packing. Johns-Manville, New York.
Liberty—Ventilators, caps. Penn Ventilator Co., Philadelphia, Pa.
Life Line "A"—Electric motors. Westinghouse Electric Corp., Pittsburgh, Pa.
Lift Gate—Gates, lift, for trucks. Anthony Co., Streator, Ill.
Light Loader—Coal and ash conveyors. New London Engineering Co., New London, Wis.
Lightweight Champ—Pipe cutting and threading machines, pipe vise stands. Oster Mfg. Co., Wickliffe, O.
Lightweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Lignophol—Enamels and lacquers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Lima—Stokers. Carnes, Inc., John R., Lima, O.
Limit-Load—Centrifugal fans. Buffalo Forge Co., Buffalo, N. Y.
LimiTorque—Valves, valve operators. Philadelphia Gear Corp., Philadelphia, Pa.
Limitrol—Alarms. Barber-Colman Co., Rockford, Ill.
Lincwelder—Welders. Lincoln Electric Co., The, Cleveland, O.
Line-A-Spede—Gear—Motors. Allis Co., Louis, The, Milwaukee, Wis.
Line-Air—Diffusers. Universal Diffuser Corp., Tuckahoe, N. Y.
Lin-E-Aire—Valves. Taylor Instrument Companies, Rochester, N. Y.
Line-Flo—Sight glasses for pipe lines, dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Lineflow—Fans. American-Standard Industrial Div., Detroit, Mich.
Linex—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Link-Grip—Pipe wrenches. American Machine Wks., Inc., Racine, Wis.
Lin-Lok—Hose. Mic-Lin Co., Maple Shade, N. J.
Linovector—Heating surface, radiation. Vulcan Radiator Co., Hartford, Conn.
Linoventilator—Unit ventilators. Vulcan Radiator Co., Hartford, Conn.
Lipco—Cement lined fittings and pipe. Cement Lined Pipe Co., Lynn, Mass.
Liquid Eye—Sight glasses. Allin Mfg. Co., Chicago, Ill.
Liquid Ice—Water chillers and refrigerating compressors. Cool-Ette, Inc., Detroit, Mich.
Liquid Precipitator—Washers. Johnson-March Corp., Philadelphia, Pa.
Liquid Wrench—Solvent. Radiator Specialty Co., Charlotte, N. C.
Liquidflux—Welding compounds, solder. Sight Feed Generator Co., West Alexandria, O.
Liqui-Jector—Filters. Selas Corp. of America, Dresher, Pa.
Liqui-Med—Oxygen piping and regulating systems. General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.
Lira—Indicators, recorders. Mine Safety Appliances Co., Pittsburgh, Pa.
Lite Cast—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.
Lite-N-Aire—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Lithoform—Protective coatings. Amchem Products, Inc., Ambler, Pa.
Little Beaver—Pumps. Johnston Pump Co., Pasadena, Calif.
Little Blacksmith—Punches, shears. Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Little Giant—Sump pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Little Giant—Stock and dies. Greenfield Tap & Die Div. of United Greenfield Corp., Greenfield, Mass.
Little Giant—Unit heaters. John J. Nesbitt, Inc., Philadelphia, Pa.
Little Giant—Pipe crimper tools. Pioneer Tool Company, Racine, Wis.
Little Landis—Portable pipe cutting and threading machines. Landis Machine Co., Waynesboro, Pa.
Livermont—Wrenches, tools. Richmont, Inc., Monrovia, Calif.
Lloyd—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Lo-Blast—Burners. Mid-Continent Metal Products Co., Chicago, Ill.
Loc-A-Leek—Clamps. Burlis Products Co., Brooklyn, N. Y.
Lockaire—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Lock-Joint—Ducts. Inland Steel Products Co., Milwaukee, Wis.
Lock-O-Seal—Seals. Parker Seal Co., Culver City, Calif.
Lockseam—Pipe. Naylor Pipe Co., Chicago.
Loctite—Cement and compounds. American Sealants Co., Hartford, Conn.
Lodestar—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Lo-K—Insulation. Lockport Mills, Inc., Lockport, N. Y.
Lolag—Heaters. American Instrument Co., Inc., Silver Spring, Md.
Lo-Line—Cooling towers. Pritchard & Co. of California, J. F., Kansas City, Mo.
Long Life—Hose, packing. Goodall Rubber Co., Trenton, N. J.
Longlife—Coating. Flexrock Co., Philadelphia, Pa.
Longrip—Pipe extractors. Ridge Tool Co., Elyria, O.
Longhorn—Heaters. Hotstream Heater Co., Cleveland, O.
Lonsor—Metallic packing. Newage Industries, Inc., Jenkintown, Pa.
Lo-Set—Stokers. Canton Stoker Corp., Canton, O.
LoStoker—Stokers. Detroit Stoker Co., Monroe, Mich.
Louvent—Ventilators. Octagon Ventilator Co., Chicago, Ill.
Louverail—Louvers and shutters. Cain Mfg. Inc., Birmingham, Ala.
Lo-Veyor—Conveyor. Ajax Flexible Coupling Co., Inc., Westfield, N. Y.
Low Amp—Arc welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Lowcost—Boilers. Murray Iron Works Co., Burlington, Ia.
Low-Line—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Lown—Machine. San Angelo Foundry & Machine Co., San Angelo, Tex.
Low Pressure Drop—Strainers. Zurn Industries, Inc., Erie, Pa.
Low Temp—Gas welding rods. Eutectic Welding Alloys Corp., Flushing, N. Y.
Loxin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Loxit—Fittings. Scovill Mfg. Co., Waterbury, Conn.
Loxite—Pipe covering adhesives. Xylos Rubber Co., Akron, O.
Lo-X-It-Trivent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Lubritex—Sleeve bearings. Gatke Corp., Chicago, Ill.
Lucite—Plastics, powder and resins. du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.
Lumetex—High temperature paint for hot surfaces. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Luminite—Boiler cleaning compounds, soot destroyers, steam system treatment. Warren Refining & Chemical Co., The, Cleveland.
Luncor—Valves. Lunkenheimer Co., Cincinnati, O.
Lupton—Unitary air conditioners. Michael Flynn Mfg. Co., Philadelphia, Pa.
Lusterlite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis.
Luxaire—Heaters. Olsen Mfg. Co., C. A., Elyria, O.

M.B.—Heaters. Montgomery Bros., San Francisco, Calif.
M.D.—Boilers. Murray Iron Wks. Co., Burlington, Ia.
M.E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.
M & E—Heaters, tubing. Merchants & Evans Co., Philadelphia, Pa.
M & F—Rubber base enamel. Valdura Div., American-Marietta Co., Chicago, Ill.
M & H—Sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
MIF—Couplings, fittings. Malleable Iron Fittings Co., Branford, Conn.
MKO—Pumps, boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
M & M—Alarms, cut-offs, feeders, operators, regulators, solenoid and solenoid coils, switches, valves. McDonnell & Miller, Inc., Chicago.
M-Cal—Nameplates. North Shore Nameplate, Inc., Bayside, N. Y.
M-Pel-Air—Blades, fans, blowers, blower wheels. Brookside Corp., McCordsville, Ind.
M-R-C—Ball bearings. Marlin-Rockwell Corp., Jamestown, N. Y.
M-Scope—Pipe locators, leak detectors. Fisher Research Laboratory, Inc., Palo Alto, Calif.
M & T—Welders, gas welding rods. Metal & Thermit Corp., Rahway, N. J.
M-VB—Valves. Scovill Mfg. Co., Waterbury, Conn.
MW-One—Adhesives, cement. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
MW-50—Adhesives, cement. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Macheta—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Maco-Glas—Treated cloth. Menardi & Co., El Segundo, Calif.
Magic—Cement and compounds. Blue Ridge Talc Co., Inc., Henry, Va.
Magic Carpet—Door controls. Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Magic Dial—Pre-assembled control systems. Midwest Automatic Control Co., Des Moines, Ia.
Magic Eye—Sight glasses. Imperial Brass Mfg. Co., Chicago, Ill.
Magic Eye—Door controls. Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Magic Pivot—Electric saws. Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.
Magic Wire—Control systems wire. Midwest Automatic Control Co., Des Moines, Ia.
Magnaflow—Pumps. The Corley Co., Bounton, N. J.
Magna-Line—Plastic pipe fittings, plastic pipe flanges, plastic pipe, plastic unions, plastic valves. Skyline Industries Sales, Inc., Titusville, Pa.
Magnefer—Refractories and refractory cement. Basic Inc., Cleveland, O.
Magnehelic—Portable analyzers, gages, kits, manometers, meters, switches, testers, tubes. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Magnetrol—Alarms, boiler cut-offs, switches. Schaub Engineering Co., Fred H., Chicago.
Magnex—Scale removal. Magnus Chemical Co., Garwood, N. J.
Magni-Chek—Valves. Watsco, Inc., Hialeah, Fla.
Magnilastic—Expansion pipe joints. Cook Electric Co., Chicago, Ill.
Magnorite—Cement, refractories and refractory cement. Norton Co., Worcester, Mass.
Magno-Therm—Analyzers. Hays Corp., The, Michigan City, Ind.
Magnox—Oxygen analyzers. Milton Roy Co., Philadelphia, Pa.
Main Line—Plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.
Mainline—Propeller fans. Main Cornice Works, Inc., Los Angeles, Calif.
Mainliner—Fan blades and fans. Burden Co., Alan E., Los Angeles, Calif.
Make-Up-Air—Unit heaters. New York Blower Co., Chicago, Ill.
Malgate—Valves. Powell Co., Wm., The, Cincinnati, O.
Malrenew—Valves. Powell Co., Wm., The, Cincinnati, O.
Manco—Plastic pipe, absorbers. Manufacturers Corp., Mansfield, O.

Mangajet—Arc welding electrodes. Lincoln Electric Co., The, Cleveland, O.

Manganend—Electrodes. Arcos Corp., Philadelphia, Pa.

Manganweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Manhattan—Packing. Greene, Tweed & Co., North Wales, Pa.

Mariaid—Valves. Hays Mfg. Co., Erie, Pa.

Mar-Flex—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.

Mark Time—Time switches. Rhodes, Inc., M. H., Hartford, Conn.

Mark XI—Welders. KSM Products, Inc., Merchantville, N. J.

Mars—Pumps. Solar Aircraft Co., San Diego, Calif.

Marvair—Unitary air conditioners. Muncie Gear Works, Inc., Muncie, Ind.

Marvel—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.

Marvelwite—Enamels and lacquers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.

Master—Fittings. Mel Products Co., The, East Haven, Conn.

Master 150#—Unions. Jefferson Union Co., Inc., Lexington, Mass.

Master-Bilt—Pumps. Schaub Engineering Co., Fred H., Chicago, Ill.

Master Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.

Mastic—Concrete insulation. Poe Co., C. W., The, Cleveland, O.

Maxaw—Electric saws. Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.

Maxicorder—Recorders. Dickson Co., Chicago, Ill.

Maximon—Gages. Longergan Co., J. E., Philadelphia, Pa.

Maxteam—Boilers. Martin Co., Inc., J. O., San Francisco, Calif.

Maxi-Therm—Furnaces, heaters. Chicago Steel Furnace Co., Chicago, Ill.

McGregor—Glasses. Chesterton Co., A. W., Everett, Mass.

Measure Marked—Plastic pipe. Plastex Co., Columbus, O.

Measurrench—Wrenches. Williams & Co., J. H., Buffalo, N. Y.

Mechanipak—Seals. Garlock Packing Co., Palmyra, N. Y.

Mechanipak—Mechanical shaft seals. United States Gasket Co., Camden, N. J.

Meco—Torches, compounds, flame cutters, leak detectors, gages, regulators, valves, welding rod. Modern Engineering Co., St. Louis, Mo.

Melco—Piping oxygen, unitary air conditioners. Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.

Meletron—Switches. Barksdale Valves, Los Angeles, Calif.

Mercury—Pipe cutting machines, benders, pipe cutting oil, pipe cutters. Obear & Sons, Inc., Inglewood, Calif.

Merrill Process—Heating systems. Parks-Cramer Co., Fitchburg, Mass.

Measurflo—Regulators, valves. Hays Mfg. Co., Erie, Pa.

Metagraphic—Transmitters. Bristol Co., The, Waterbury, Conn.

Metalene—Cleaning compounds. Lester Laboratories, Inc., Atlanta, Ga.

Metal-Master—Shears. Wiss & Sons Co., J., Newark, N. J.

Metalflo—Tubes and tubing. H & H Tube & Mfg. Co., Detroit, Mich.

Metalset—Caulking and sealing compounds. Smooth-On Mfg. Co., Jersey City, N. J.

Metameter—Transmitters. Bristol Co., The, Waterbury, Conn.

Metermax—Systems. Leeds & Northrup Co., Philadelphia, Pa.

Meteor—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Metlcap—Vent flue caps, pipe and fittings. Hart and Cooley Mfg. Co., Holland, Mich.

Met-L-Flex—Bases and pads. Robinson Aviation, Inc., Teterboro, N. J.

Met-L-Tex—Protective coatings. France Refractories Co., J. H., Snow Shoe, Pa.

Metl-Tech—Doors and panels, metal sheets. Technical Ply-Woods Sales, Chicago, Ill.

Metlvent—Pipe and fittings. Hart & Cooley Mfg. Co., Holland, Mich.

Mex-Ko—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.

Miami—Fans, doors and panels. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Micrelay—Controllers and starters, relays. Ebert Electronics Corp., Queens Village, N. Y.

Micretain—Air filters. Cambridge Filter Corp., Syracuse, N. Y.

Micro—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.

Micro—Valves. Integral Corp., Long Island, N. Y.

Micro-Dri—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.

Microdyne—Dust collectors. Joy Mfg. Co., Pittsburgh, Pa.

Micro-Feed—Humidifiers. Cleveland Humidifier Co., Cleveland, O.

Micro-Feeder—Pumps. B-I-F Industries, Proportioneers Div., Providence, R. I.

Micro-filters—Filters. Selas Corp. of America, Dresher, Pa.

Micro-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.

Microlite—Insulation. Johns-Manville, New York, N. Y.

Micro-Lok—Insulation. Johns-Manville, New York, N. Y.

Micromet—Water treatment. Calgon Co., Div. of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.

Micro Motors—Motors. Redmond Co., Inc., Owosso, Mich.

Micro-Netic—Feeders. Campbell Co., J. A., Long Beach, Calif.

MicroRold—Sheets. Washington Steel Corp., Washington, Pa.

Micro-Screen—Filters. Cuno Engineering Corp., Meriden, Conn.

Microsen—Flame failure controls, alarms, indicator-controllers, indicators, transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Microtex—Insulation. Johns-Manville, New York, N. Y.

Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.

Micro Valve—Valves. Barworth, Inc., Springfield, N. J.

Micro-Weld—Spot welders. Micro Products Co., Chicago, Ill.

Midco—Heaters. Mid-Continent Metal Products Co., Chicago, Ill.

Midget—Radiation. Utica Radiator Corp., Utica, N. Y.

Midget—Float valves. Maid-O'-Mist, Inc., Chicago, Ill.

Midget Powerhouse—Unit heaters. Century Engineering Corp., Cedar Rapids, Ia.

Midg-O-Matic—Valves. Hays Mfg. Co., Erie, Pa.

Mighty Midget—Drills. Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.

Mighty Mite—Thermostats. Mechanical Industries Production Co., Akron, O.

Mighty-Mite—Fasteners, tools. Remington Arms Co., Inc., Bridgeport, Conn.

Mikro-Collectro—Dust collectors. Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Summit, N. J.

Mikro-Pulsaire—Dust collectors. Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Summit, N. J.

Mikro Rotary Feeder—Feeders. Pulverizing Machinery Div., Metals Disintegrating Co., Inc., Summit, N. J.

Mil-Ac—Air conditioning units. Ellis & Watts Products, Inc., Cincinnati, O.

Milcor—Caps, dampers, pipe and fittings, ducts, doors and panels, hangers and supports, ventilators. Inland Steel Products Co., Milwaukee, Wis.

Milford—Tools. Thompson & Son Co., The Henry G., New Haven, Conn.

Mills—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.

Milroyal—Indicators, regulators. Milton Roy Co., Philadelphia, Pa.

Mindicator—Gages. Dickson Co., The, Chicago, Ill.

Minditrol—Indicator-controllers. Dickson Co., Chicago, Ill.

Mine-Line—Plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.

Mineralead—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.

Minicordes—Recorders. Dickson Co., The, Chicago, Ill.

Minirelay—Controllers and starters, relays, switches. Ebert Electronics Corp., Queens Village, N. Y.

Mipatan—Hammers, tools. Port City Machine & Tool Co., Muskegon, Mich.

Mipco—Valves. Associated Valve Co., North Wales, Pa.

Miracle Anchors—Fasteners. Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y.

Miracle Red—Coatings. Debevoise Co., The, Brooklyn, N. Y.

Mistkop—Collectors. Aget Mfg. Co., Adrian, Mich.

Mixend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

Mizzou—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.

Mobilene—Gaskets. Johns-Manville, New York, N. Y.

Model-F—Wrenches. Richmont, Inc., Monrovia, Calif.

Model Star—Valves. Powell Co., Wm., The, Cincinnati, O.

ModernAire—Fans, unit air conditioners. National Gas Equipment Co., Inc., Denison, Tex.

Modern-Line—Plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.

Modu-Aire—Air conditioning units. United States Air Conditioning Corp., Delaware, O.

Moduflow—Control systems. Minneapolis-Honeywell Regulator Co., Minneapolis.

Modulatic—Boilers. Vapor Heating Corp., Chicago, Ill.

Modulectric—Heaters. Vapor Heating Corp., Chicago, Ill.

Modutrol—Heating systems, valve and duct operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Modutron—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Modu-Wave—Welders. Sciaky Bros., Inc., Chicago, Ill.

Mogul—Packing. Johns-Manville, New York.

Moist-Trol—Valves. Raymanco Mfg. Co., Owatonna, Minn.

Moisture Magnet—Dehumidifiers. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.

Moleculor Sieve—Dehydrators. Remco, Inc., Zelienople, Pa.

Moncrief—Heaters. Henry Furnace Co., The, Medina, O.

Monel—Pipe fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Monend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

Monitor—Boilers. Cleaver-Brooks Co., Milwaukee, Wis.

Monmouth—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.

Monobloc—Pumps. Worthington Corp., East Orange, N. J.

Monobolt—Chillers, heat exchangers, oil coolers, water heaters. Graham Mfg. Co., Great Neck, Long Island, N. Y.

Mono-Cast—Pipe. American Cast Iron Pipe Co., Birmingham, Ala.

Monofin—Radiation. Wesix Electric Heater Co., San Francisco, Calif.

Monoflo—Hot water heating systems and fittings. Bell & Gossett Co., Morton Grove, Ill.

Mono Kover—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.

Mono-Line—Refractories. Quigley Co., Inc., New York, N. Y.

Mono Motors—Motors. Redmond Co., Inc., Owosso, Mich.

Mono-Peen—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.

Monotube—Drives. Link-Belt Co., Chicago, Ill.

Monovent—Ventilators. Burt Mfg. Co., Akron.

Monoweld—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Monoxer—Detectors. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Monoxivent—Fittings. Kent-Moore Organization, Inc., Warren, Mich.

Monsoon—Fans. Jamieson Mfg. Co., Dallas, Texas.

Mor-Aire—Propeller fan blades. Maurey Mfg. Corp., Chicago, Ill.

Morflex—Flexible couplings. Morse Chain Co., Ithaca, N. Y.

Mor-Grip—Drives, V belts. Maurey Mfg. Corp., Chicago, Ill.

Morlex—Steam system treatment. Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.

Mortite—Gaskets, caulking and sealing compounds, tape. Mortell Co., J. W., Kankakee, Ill.

Motoreducer—Gear—motors. Falk Corp., Milwaukee, Wis.

MotoReducer—Speed reducers. Philadelphia Gear Corp., Philadelphia, Pa.

Motorgear—Gear—motors, reducer and increasers. Link-Belt Co., Chicago, Ill.

Motorstoker—Stokers. Hershey Motorstoker, Manheim, Pa.

Motosteel—Valves. Taylor Instrument Companies, Rochester, N. Y.

Mototrol—Indicator-controllers. Automatic Control Co., St. Paul, Minn.

Mototurb—Ventilators. Uno Ventilator Co., Malden, Mass.

Mouat—Compounds, eliminators, traps. Squires Co., C. E., The, Cleveland, O.

Mounts—Bases and pads. Lord Mfg. Co., Erie, Pa.

Muckle-Vent—Ventilators. Muckle Mfg. Co., Owatonna, Minn.

Mulsifyre—Nozzles. Grinnell Co., Inc., Providence, R. I.

Multalarm—Alarms. Automatic Control Co., St. Paul, Minn.

Multiblade—Welding fume exhausters. General Blower Co., Morton Grove, Ill.

Multiclone—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.

Multi-Cold—Compressors. Multiplex Mfg. Co., Berwick, Pa.

Multi-Duty—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Multi-Duty—Pulleys and sheaves. Gates Rubber Co., The, Denver, Colo.

Multifin—Radiation. American-Standard Plumbing & Heating Div., New York, N. Y.

Multiflex—Ducts and duct fittings. United States Rubber Co., New York, N. Y.

Multiguard—Electric motors. Lincoln Electric Co., The, Cleveland, O.

Multi-Louver—Drives. Link Belt Co., Chicago, Ill.

Multi Mount—Speed reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Multi-Pak—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Multiplane—Vibration isolating bases. Lord Mfg. Co., Erie, Pa.
Multiport—Valves. Permutit Co., The, A Div. of Pfaudler Permutit, Inc., New York, N. Y.
Multi-Pul—Hoists. Indus Corp., Indianapolis, Ind.
Multi-Seal—Repair plugs. Kenney Co., L. C., Chicago, Ill.
Multitemp—Boilers. Hydrotherm, Inc., Northvale, N. J.
Multitherm—Air conditioning units. Clarage Fan Co., Kalamazoo, Mich.
Multi-Tip—Gas burners. Dalzen Mfg. Co., St. Clair, Mich.
Multitube—Tubing. Crescent Insulated Wire & Cable Co., Trenton, N. J.
Multi-Use—Masonry drills. U. S. Expansion Bolt Co., York, Pa.
Multivane—Fans, blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Multi-V-Drive—Drives. Worthington Corp., East Orange, N. J.
Multi-Wash—Dust collectors, washers. Schneible Co., Claude B., Detroit, Mich.
Multuri—Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Murex—Welding electrodes. Metal & Thermit Corp., Rahway, N. J.

N-B—Boilers. Nebraska Boiler Co., Inc., Lincoln, Nebr.
NCG—Leak detectors, solder, oxygen systems, welding rod. National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
N-M-D—Valves. Lunkenheimer Co., Cincinnati, O.
NYB—Heating surface, fans, unit heaters. New York Blower Co., Chicago, Ill.
Nail-A-Matic—Tools. Matrix Engineering Corp., Minneapolis, Minn.
Nalco—Solder. National Lead Co., New York.
National Ground Anodes—Devices. National Carbon Co., Div. of Union Carbide Corp., New York, N. Y.
National—Cutters, pipe cutting machines. Wachs Co., E. H., The, Chicago, Ill.
National—Furnaces, heaters. MaGirl Foundry & Furnace Co., Bloomington, Ill.
Natorq—Seals. Navan Products, Inc., El Segundo, Calif.
Natur Temp—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Navalon—Fiber packing. Johns-Manville, New York, N. Y.
N.E. Hite—Units. Barclay, Inc., Robert, Chicago, Ill.
Nelex—Electric heating cable. Nelson Electric Mfg. Co., Tulsa, Okla.
Nelson—Stokers, air diffusers, pumps, unitary air conditioners, ventilators. Heating Assurance, Inc., Spokane, Wash.
Nelsonaire—Unit ventilators. Herman Nelson Products, American Air Filter Co., Inc., Louisville, Ky.
Nelweld—Welders. Gregory Industries, Inc., Nelson Stud Welding Div., Lorain, O.
Nemo—Insulating cement. Smith & Kanzler Corp., Linden, N. J.
Neobon—Corrosion shields for pipe joints. Atlas Mineral Products Co., Mertztown, Pa.
Neo Coat—Coatings. Pennsalt Chemicals Corp., Philadelphia, Pa.
Neoprene—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Neo-Shear Mounts—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
Nerva-Kote—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nerva-Plast—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nervatape—Industrial tape. Rubber & Plastics Compound Co., New York, N. Y.
New Cyclone—Dust collectors. Kirk & Blum Mfg. Co., Cincinnati, O.
New Port—Pumps. Everite Pump & Mfg. Corp., Lancaster, Pa.
Newport—Air conditioning units. Webster & Co., Warren, Camden, N. J.
Niagara—Meters. Buffalo Meter Co., Inc., Buffalo.
Nibblers—Electric portable shears. Fenway Machine Co., Philadelphia, Pa.
Nib-Shear—Power shears. H. A. Mfg. Co., York, Pa.
Nickelend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nickel-Arc—Electrodes. Alloy Rods Co., York, Pa.
Nickend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nicloy—Pipe, tube, tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Nicuend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
"9000" Arc—Torches. Mid-States Welder Mfg. Co., Chicago, Ill.
NiTectic—Arc welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
No Crush—Hose. Ammerman Co., Inc., Stillwater, Minn.
No Drip—Insulation, insulating cement, protective coating. J. W. Mortell Co., Kankakee, Ill.
No Drip Tape—Pipe insulation, pipe wrap. Mortell Co., J. W., Kankakee, Ill.
Nocordal—Pipe coils, refrigerating condensers, and heat exchangers. Heil Process Equipment Corp., Cleveland, O.
No-Flex—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Nofome—Pumps. Ladish Co., Tri-Clover Div., Kenosha, Wis.
No-Mar—Pipe wrenches. Nielsen, Inc., E. V., Stamford, Conn.
Non-Clog—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Non-clog—Pipe line strainers. Boylston Steam Specialty Co., Chicago, Ill.
Non-Clogging—Spray nozzles. Link-Belt Co., Chicago, Ill.
Non-Con-Dux—Cement, adhesives, insulation. Grant Wilson, Inc., Chicago, Ill.
Non-Frost—Insulation. Keasbey & Mattison Co., Ambler, Pa.
No-Nox—Absorbers. Beacon Brass Co., Waltham, Mass.
Non-Sweat—Insulation. Keasbey & Mattison Co., Ambler, Pa.
No-Ox-Id—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
No-Ox-Id Wrap—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
Norblo—Dust collectors, fans. Northern Blower Co., Cleveland, O.
Norcoat—Tank linings. Norwood Associated Engineers, Inc., Springfield, Mass.
Nordensson—Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Northco—Ventilators. Wood Mfg. Co., A. R., Luverne, Minn.
No-Skive—Non-metal hose and fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
No-Spat—Welding compounds. Midland Industrial Div., The Harrison Paint & Varnish Co., Canton, O.
No-Thread—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Novelon—Protective coatings, tank linings. Ellicott Fabricators, Inc., Baltimore, Md.
No-Vent—Pumps and systems, circulators for hot water heating systems. Stout & Sons, David, St. Louis, Mo.
No Vision—Grilles. Independent Register Co., Cleveland, O.
Novoid—Insulation, adhesives, vibration isolating bases. National Cork Co., Englewood, N. J.
Nu-Air—Adsorbers. Manning Co., Charles E. Pittsburgh, Pa.
Nu-Air—Fans, window ventilator units, blades, louvers and shutters, radiation. Meier Electric, Indianapolis, Ind.
Nu-Alpina—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Nubelite—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Nubeloid—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Nubelyn—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Nu-Pon—Protective coatings for metals. Glidden Co., The, Cleveland, O.
Nullmatic—Gages, indicators, insulation, recorders. Moore Products Co., The, Philadelphia, Pa.
Nu-Notch—Mushroom ventilators, diffusers. Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Nupro—Valves. Nuclear Products Co., Cleveland, O.
Nu-Rail—Pipe fittings. Hollaender Mfg. Co., Cincinnati, O.
NuTwist—Welders. P. R. Mallory & Co., Inc., Indianapolis, Ind.
Nu-Vac—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.
Nu-Wrap—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nyavco—Valves, gages. New York Air Valve Corp., Brooklyn, N. Y.
Nylaflow—Non-metal hose and fittings. Polymer Corp., The, Reading, Pa.
Nylasint—Plastics, powder and resins. Polymer Corp., Reading, Pa.
Nylatron—Plastics, powder and resins. Polymer Corp., Reading, Pa.
Nylo-Flex—Refrigerant charging hose. Techniflex Div., Port Jervis, N. Y.
Nylo-Seal—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.

OB—Valves. Ohio Brass Co., Mansfield, O.
O-B Equatemp—Valves. Ohio Brass Co., Mansfield, O.
OCH—Filters. American Air Filter Co., Louisville, Ky.
O&S—Burners. Orr & Sembower, Inc., Reading, Pa.
OX—Sheet metal punches. Duro-Dyne Corp., Long Island, N. Y.
Oakmont—Boilers. American-Standard Plumbing & Heating Div., New York, N. Y.
Oasis—Electric plug-in dehumidifiers. Ebco Mfg. Co., Columbus, O.
Ohioan—Heaters. Hotstream Heater Co., Cleveland, O.
Ohmstone—Panel and control boards. Johns-Manville, New York, N. Y.
Oilbuster—Boiler cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Oil-O-Matic—Heaters. Williams Oil-O-Matic Heating Co., Div. of National Union Electric Corp., Columbus, O.
Oiltex—Gaskets. Chicago Gasket Co., Chicago, Ill.
Okay Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Ol' Faithful—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Omega—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Omniguard—Temperature alarms, indicator-controllers. Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., West Orange, N. J.
"100" Power Drive—Pipe cutting and threading machines. Oster Mfg. Co., Wickliffe, O.
"100" Power Vise—Pipe vise stands. Oster Mfg. Co., Wickliffe, O.
1 Way Weather Flo—Thermostats. Automatic Devices Div. of American Machine & Metals, Inc. Western Springs, Ill.
Opo-Matic—Regulators. Elgen Mfg. Co., Long Island City, N. Y.
Opto-Matic—Oilers. Trico Fuse Mfg. Co., Milwaukee, Wis.
Oriflo—Flanges. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Ori-Flowrator—Flow measuring orifices. Fischer & Porter Co., Hatboro, Pa.
"O" Rings—Packing. Linear Inc., Philadelphia, Pa.
Overust—Protective coatings. Chem Industrial Co., Brooklyn, O.
Oxequip—Oxygen systems, meters, regulators, pumps, valves. Oxygen Equipment & Service Co., Chicago.
Ox-Gem—Treatment. Anderson Chemical Co., Inc., Macon, Ga.
Oxi-Ban—Compounds. Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Oxidizer—Filters. Purcolator Products, Inc., Rahway, N. J.
Oxweld—Welding rod, electrodes, valves, oxygen piping & regulating systems, torches, welding and cutting apparatus. Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Oxyarc—Welding and cutting apparatus. Arcos Corp., Philadelphia, Pa.
Oxycuttend—Welding and cutting apparatus. Arcos Corp., Philadelphia, Pa.
Oxyleak—Piping leak detectors. Oxygen Equipment & Service Co., Chicago, Ill.
Oyltite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Ozark—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Ozite—Insulation. American Hair & Felt Co., Chicago, Ill.
Ozonators—Ozone apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PA 400—Dehydrant and acid neutralizer. W. R. Grace & Co., Davison Chemical Div., Baltimore, Md.
P. B. H.—Cocks, protectors, valves, try cocks. Paul B. Huyette Co., Inc., Philadelphia, Pa.
P-D—Fittings. Sullivan Valve & Engineering Co., Butte, Mont.
P-D—Pumps. DeVilbiss Metal Fabricators Co., Detroit.
PD QC—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
P.E.T.—Drills and motors. Portable Electric Tools, Inc., Chicago, Ill.
PG's—Coils and panels. American Brass Co., Waterbury, Conn.
P & H—Engines, hoists, arc welders. Harnischfeger Corp., Milwaukee, Wis.
P & H Smootharc—Arc welding electrodes. Harnischfeger Corp., Milwaukee, Wis.
P.I.V. Variable Speed Drive—Changer. Link-Belt Co., Chicago, Ill.
P-K—Eliminators. Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
P-R—Burners. Selas Corp. of America, Dresher, Pa.
PRC Rubber Calk—Caulking and sealing compounds. Products Research Co., Los Angeles, Calif.
PSC—Regulators, dehumidifiers. Perfecting Service Co., Charlotte, N. C.
Pace-King—Boilers. Burnham Corp., Irvington, N. Y.
Pacemaker—Heaters. Payne Co., LaPuente, Calif.

Pacemaker—Softeners. Stover Water Softener Co., St. Charles, Ill.
Pacemakers—Coolers. McQuay, Inc., Minneapolis, Minn.
Pacific—Furnaces, heaters. Rosebraugh Co., W. W., Salem, Ore.
Package-Aire—Air conditioning units. United States Air Conditioning Corp., Delaware, O.
Packex—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Paco—Turbine pumps. Pacific Pumping Co., Oakland, Calif.
Page Sensor—Alarms. Hogart Engineering Co., Los Angeles, Calif.
Paget—Strainers. Self Cleaning Strainer Co., Oak Lawn, Ill.
PAINTGRIP—Sheets. Armco Steel Corp., Middletown, O.
Paintstiks—Identification markers. Markal Co., Chicago, Ill.
Paladin—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Palco—Packing. Greene, Tweed & Co., North Wales, Pa.
Palcotan—Water treatment. Pacific Lumber Co., The, San Francisco, Calif.
Palco Wool-Saferized—Insulation. Pacific Lumber Co., The, San Francisco, Calif.
Palladrin-Mastic—Tank linings. Emjay Maintenance Engineers, Rutherford, N. J.
Palm-Aire—Air conditioning units. Palmer Mfg. Corp., Phoenix, Ariz.
Palmetto—Packing, gaskets, shaft seals. Greene, Tweed & Co., North Wales, Pa.
Palmetto G-T Ring—Packing. Greene, Tweed & Co., North Wales, Pa.
Palmetto Super Sheat—Gaskets, packing. Greene, Tweed & Co., North Wales, Pa.
Pandux—Thermometer wells. Pacific Transducer Corp., Los Angeles, Calif.
Panelair—Heaters. Payne Company, La Puente, Calif.
Panelbloc—Heaters, radiators. The Bettcher Mfg. Corp., Cleveland, O.
Panel Coil—Coils, dryers, exchangers, heaters. Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N.Y.
Panelouvre—Door grilles. Ventilouvre, Inc., Marietta, O.
Panelramic—Cooling towers. Pritchard & Co. of California, J. F., Kansas City, Mo.
Panelray—Heaters. Day & Night Mfg. Co., La Puente, Calif.
Panel-Tex—Panel and control boards. Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Paneltrol—Valves. Taco Heaters, Inc., Cranston, R. I.
Panther—Plastic pipes. Western Plastics Corp., Tacoma, Wash.
Papco—Cutters and tools. Penn Brass & Copper Co., Erie, Pa.
Paracoil—Coils, condensers, converters, heaters, leak detectors, oil coolers, exchangers, preheaters, steam traps, pipe nipples, water chillers, aftercoolers, heating units, valves, vaporizers. Davis Engineering, CA Div. of American Metal Products Co., Wallington, N. J.
Para-flex—Couplings. Dodge Mfg. Corp., Mishawaka, Ind.
Paraflo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Parallel Shaft—Reducers and increasers. Link-Belt Co., Chicago, Ill.
Paramount Master—Air conditioning units. Essick Mfg. Co., Los Angeles, Calif.
Parasol—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Peak-Temp—Preheaters, fuel oil. Cleaver-Brooks Co., Milwaukee, Wis.
Peck Carrier—Conveyors. Link-Belt Co., Chicago, Ill.
Pee Vee Cee—Fittings, hoods, plastic pipe. Atlas Mineral Products Co., Mertztown, Pa.
Pee Vee Seal—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.
Peerless—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Peerless—Direct radiation. American-Standard Plumbing & Heating Div., New York, N. Y.
Pelro—Asbestos packing. Greene, Tweed & Co., North Wales, Pa.
Pemoc—Cleaning compounds. Peters Co., The, Div of Toledo Paint & Chemical Co., Toledo, O.
Penflex—Hose, flexible, tubing. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Penflex-Weld—Adsorbers. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Pennco—Sectional cast iron boilers. Pennsylvania Furnace & Iron Co., Warren, Pa.
Penthouse—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Perchloron—Water and chemical treatment. Pennsalt Chemicals Corp., Philadelphia, Pa.
Percojet—Wall heaters. Electric Heating & Cooling, Inc., Newark, N. J.
Perfectaire—Dehumidifiers, fans, furnaces, heaters, louvers and shutters, air conditioning units, ventilators. Air Conditioning Engineering Co., Cambridge, Mass.
Perfection—Plates. Beaton & Cadwell Mfg. Co., New Britain, Conn.
Perfecto—Observation boiler ports, cement. Green Fire Brick Co., A. P., Mexico, Mo.
Perfecto—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Perflex—Hose. Perfecting Service Co., Charlotte, N. C.
Perfusaire—Diffusers, registers. Auer Register Co., Cleveland, O.
Perimaheat—Radiation. Young Radiator Co., Racine, Wis.
Perma-Clean—Air filters. Buckeye Mfg., Inc., Columbus, O.
Perma-Code—Identification markers, pipe, hole and saddle markers. Brady Co., W. H., Milwaukee, Wis.
Permadine—Protective coatings. Amchem Products, Inc., Ambler, Pa.
Perma-Fan—Condensers. Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Permagum—Adhesives. Presstite Div., American-Marietta Co., St. Louis, Mo.
Perm-Align—Drills. Cummins Portable Tools, Div. of John Oster Mfg. Co., Milwaukee, Wis.
Permaline—Fittings, piping conduits. Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.
Permalite—Valves. Harman Equipment Co., Los Angeles, Calif.
Permanent Pyro—Anti-freeze compounds. Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Permanite—Plastic pipe, ducts and duct fittings, and valves. Knight, Maurice A., Akron, O.
Permaseal—Gaskets. Chicago Gasket Co., Chicago, Ill.
Permatower—Cooling towers. Marley Co., The, Kansas City, Mo.
Perma-Trim—Convection type radiation. Modine Mfg. Co., Racine, Wis.
Pero-Klean—Cleaning compounds, treatment. Perolin Co., Inc., The, New York, N. Y.
Pero-Nite—Soot destroyers. Perolin Co., Inc., New York, N. Y.
Pet-Re-Kleen—Treatment. Normal Chemical Co., St. Paul, Minn.
Pet-Re-Nol—Fuel oil treatment to prevent sludge. Normal Chemical Co., St. Paul, Minn.
Pexto—Brakes, punches, shears, wrenches, machines. Peck, Stow & Wilcox Co., Southington, Conn.
Phantom-Dial-o-Vent—Exhaust fittings. National System of Garage Ventilation, Inc., Decatur, Ill.
Phenolex—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.
Phoson—Solder. United Wire & Supply Corp., Cranston, R. I.
Phos-Trode—Electrodes. Ampco Metal, Inc., Milwaukee, Wis.
Phostube—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Photoswitch—Switches. Electronics Corp. of America, Cambridge, Mass.
Pilostat—Flame failure controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pilotair—Valves. Westinghouse Air Brake Co., Industrial Products Div., Wilmerding, Pa.
Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.
Pin-Tite—Fasteners. Taft Jenkins Co., Inc., Holyoke, Mass.
Pioneer—Thermostats. Crown Controls Co., Inc., New Bremen, O.
Pipeasy—Pipe Cement. Flexrock Co., Philadelphia, Pa.
Pipe Line—Strainers. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Pipeliner—Torches, welding and cutting apparatus. Smith Welding Equipment Corp., Minneapolis, Minn.
Pipemaster—Wrenches, pipe vise stands, pipe cutters and vises. Erie Tool Wks., Erie, Pa.
Pipetite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Pipewrap—Pipe insulation. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Pistonair—Motors. Joy Mfg. Co., Pittsburgh, Pa.
Pitchlign—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
Pittsburgh-National—Meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Plain—Radiation. Vapor Heating Corp., Chicago, Ill.
Planeweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Plascene—Wire. Chester Cable Corp., Chester, N. Y.
Plas-Dux—Caulking and sealing compounds. Babbitt Chemical Co., New Bedford, Mass.
Plasgon—Cement and compounds. Samuel Cabot, Inc., Boston, Mass.
Plaskon—Plastics, powders and resins. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.,
Plast-A-Chrome—Belting. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Plastic Gasket—Pipe cement. Flexrock Co., Philadelphia, Pa.
Plasticord—Wiring. Chester Cable Corp., Chester, N. Y.
Plasticore—Wire. Chester Cable Corp., Chester, N. Y.
Plasticote—Electric wire. Chester Cable Corp., Chester, N. Y.
Plastilock—Adhesives. Goodrich Industrial Products Co., B. F., Akron, O.
Plastimode—Sheets. Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Plastograph—Viscometers. Brabender Corp., Rochelle Park, N. J.
Plastoid—Furnace cement, caulking & sealing compounds. Plastic Products Co., Detroit, Mich.
Pla-Tank—Ducts and duct fittings, plastic sheets, plastic tubing. Haveg Industries, Inc., Wilmington, Del.
Platecoils—Coils and radiation, exchangers, heaters, finned surface, superheaters. Tranter Mfg., Inc., Lansing, Mich.
Plateform—Vibration isolating bases. Lord Mfg. Co., Erie, Pa.
Plexiform—Fans. Bayley Blower Co., Milwaukee, Wis.
Plica—Hose, tubing. Flexaust Co., New York, N. Y.
Plicast—Refractories. Plibrico Co., Chicago, Ill.
Plidco-Flanges—Fittings, flanges. Pipe Line Development Co., Cleveland, O.
Pliogard—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Pliotron—Filters. Goodyear Tire & Rubber Co., Akron, O.
Plisulate—Insulating cement and insulation. Plibrico Co., Chicago.
Plumber Krak-Stik—Cement and compounds. Lake Chemical Co., Chicago, Ill.
Pluralloy—Electrodes. McKay Co., Pittsburgh, Pa.
Pluto-Blue Asbestos—Packing. North American Asbestos Corp., Chicago, Ill.
Ply-Tech—Plywood sheets and board. Technical Ply-Woods Sales, Chicago, Ill.
Pneumadiesel—Air compressors. Schramm, Inc., West Chester, Pa.
Pneumafoil—Duct dampers. Connor Engineering Corp., Danbury, Conn.
Pneumapower—Air compressors. Schramm, Inc., West Chester, Pa.
Pneumastat—Aftercoolers. Schramm, Inc., West Chester, Pa.
Pneumatractor—Aftercoolers. Schramm, Inc., West Chester, Pa.
Pneu-Pump—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Poeco—Insulation, coatings, concrete insulating. Poe Co., C. W., Cleveland, O.
Polar Pak—Air conditioning units. Coleman Co., Inc., The, Wichita, Kans.
Polartron—Relays, regulators, systems, switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pollux—Meters, recorder-totalizers. Air-Conditioning Equipment Corp., New York, N. Y.
Polyfax—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Poly-Flo—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.
Polymerin—Protective coatings, enamel and lacquers. International Corp., Finishes Div., Newark, N. J.
Polypenco—Plastic pipe, hose and tubing clamps, tubing. Polymer Corp., The, Reading, Pa.
Poly-Plus Blue—Pipe fittings. Union Malleable Mfg. Co., Ashland, O.
Polyprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Polystix—Adhesives. Adhesive Products Corp., New York, N. Y.
Polytherm—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Pony—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.
Popular Stillson—Wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Poro-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.
Poronze—Filters and porous metals. Wabash Corp., Chicago, Ill.
Poro-Stone—Filters, dehumidifiers. Adams Co., Inc., R. P., Buffalo, N. Y.
Porta-Heet—Heaters. Auburn Burner Co., Auburn, Ind.
Port-A-Pony—Pipe cutting machines. Thread-Ezy Mfg. Co., Corunna, Mich.
Porta Drive—Pipe cutting machines. Muncie Gear Wks., Inc., Muncie, Ind.
Porto-Power—Pipe benders and pipe pushers, pumps, punches. Blackhawk Mfg. Co., Milwaukee, Wis.
Porto Shears—Shears. Black & Decker Mfg. Co., Towson, Md.
Portovent—Hose, duct connections, ducts and duct fittings. Flexaust Co., New York, N. Y.
Positive Arc—Arc welders. Welding Apparatus Co., Chicago, Ill.

Power—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Poweraire—Furnaces. Jackson & Church Co., Saginaw, Mich.
Powerated—Furnaces. Jackson & Church Co., Saginaw, Mich.
Powered Low-Line—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Powered Valvent—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Power-Flow—Ventilators. DeBothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Power Gems—Boilers. Edge Moor Iron Works, Inc., Edge Moor, Del.
Power King—Belts. Goodall Rubber Co., Trenton, N. J.
Powermaster—Fans. Acme Engineering & Mfg. Corp., Muskogee, Okla.
Power Master—Boilers. Orr & Sembower, Inc., Reading, Pa.
Power-Mate—Fasteners, tools. Remington Arms Co., Inc., Bridgeport, Conn.
Poweroil—Oil burners. Jackson & Church Co., Saginaw, Mich.
Power-Pak—Boilers. Orr & Sembower, Inc., Reading, Pa.
Power Plant—Pumps. Schaub Engineering Co., Fred H., Chicago, Ill.
Power Vane CP—Drills, motors. Chicago Pneumatic Tool Co., New York, N. Y.
Power vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Powrdraulic—Cylinders. Hanna Engineering Wks., Chicago, Ill.
Powrmatic—Cylinders. Hanna Engineering Wks., Chicago, Ill.
Praetorian—Unit ventilators. Valveblower Co. of Calif., Santa Fe Springs, Calif.
Prasco—Insulation, insulating cement. Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., San Francisco, Calif.
Pratt & Cady—Valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Pre-Bilt—Conveyors. Link-Belt Co., Chicago, Ill.
Precision—Nozzles. Benjamin Air Rifle Co., St. Louis, Mo.
Pre-Fab-Ric—Connections. Cain Mfg. Inc., Birmingham, Ala.
Pre-Krete—Coatings, tank linings. Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
Premier—Welding rod. American Steel & Wire Div., United States Steel, Cleveland, O.
Prep—Protective coatings for metals. Neilson Chemical Co., Detroit (Ferndale), Mich.
Presslok—Nylon pipe fittings. Nylon Molding Corp., Garwood, N. J.
Presst-O-Cel—Pipe and tubing insulation. Presstite Div., American-Marietta Co., St. Louis, Mo.
Pressure Clix—Switches. Nason Co., Clarkston, Mich.
Pressure-Speed—Parts for heating and air conditioning equipment. Refrigeration Devices Co., Nutley, N. J.
Pressuretrol — Switches. Minneapolis-Honeywell Regulator Co., Minneapolis.
Pressurmite—Switches. Friez Instrument Div., Bendix Aviation Corp., Towson, Baltimore, Md.
Presto—Water softeners. Wood Mfg. Co., A. R., Luverne, Minn.
Prest-O-Lite—Leak detectors, torches, welding and cutting apparatus. Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Presto-Lock—Couplings. Smith Bros. Co., Oak Park, Ill.
PreSwitch—Switches. Longergan Co., J. E., Philadelphia, Pa.
Princo—Gages, alarms, hygrometers, manometers, psychrometers, regulators, relays, thermometers. Precision Thermometer and Instrument Co., Philadelphia, Pa.
Progress—Boilers. Cleaver-Brooks Co., Milwaukee, Wis.
Propeloflo—Meters. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Protecto—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Protectoglo—Controls. Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Protectomotor—Air filter separators. Dollinger Corp., Rochester, N. Y.
Protectorelay—Flame failure controls, relays, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Protekto-Flex—Insulation. Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y.
Protektinsul—Protective coatings. Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y.
Pryzoak—Belting. Graton & Knight Co., Worcester, Mass.
Psychron—Psychrometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Pubco—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Pubco Bronze—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Pul Air—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Pul-Air Ridge—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Pulling—Circulators, pumps. Columbus Steam Pump Works Co., Columbus, O.
Pulsafeeder—Pumps. Lapp Insulator Co., LeRoy, N. Y.
Pulsatherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pump-A-Matic—Sump pumps. Reif-Rexoil, Inc., Buffalo, N. Y.
Pump King—Pumps. Ladish Co., Tri-Clover Div., Kenosha, Wis.
Punkah Louvres—Air diffusers. Thermotank, Inc., Products Div., Detroit, Mich.
Puraflo—Filters, separators. Harman Equipment Co., Los Angeles, Calif.
PurAir—Adsorbers, air filters, air sterilizing units, ventilators. Barnebey-Cheney Co., Columbus, O.
Puritan—Penetrant solvent for loosening scale and threaded joints. Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Purj-All—Compounds. Lindy Heaters, Inc., New York, N. Y.
Purox—Welding and cutting apparatus, torches. Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Pylets—Switches, pilot and signal lights. Pyle-National Co., The, Chicago, Ill.
Pyramid—Packing. Greene, Tweed & Co., North Wales, Pa.
Pyratherm—Controls. Mercoid Corp., The, Chicago, Ill.
Pyrex—Glass pipe, electric heating panels, heaters, thermometer wells, heat exchangers, gage and sight glasses, valves. Corning Glass Wks., Corning, N. Y.
Pyrocouple—Thermometers. Royco Instruments, Mountain View, Calif.
Pyroflex—Coatings, tank linings, lined pipes, tanks, enamels and lacquers. Knight, Maurice A., Akron.
Pyrojector—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.
Pyroprobes—Thermometers. Royco Instruments, Mountain View, Calif.
Pyrotac—Alarms. Illinois Testing Laboratories, Inc., Chicago, Ill.
Pyrotemps—Thermometers. Royco Instruments, Mountain View, Calif.
Pyrotrol—Flame failure controls. Bristol Co., The, Waterbury, Conn.
Pyrotron—Recorders. Bailey Meter Co., Cleveland, O.
Pyrovisor—Controls. Bristol Co., The, Waterbury, Conn.

QD—Pulleys and sheaves. Worthington Corp., East Orange, N. J.
QSV—Couplings. Dahl Co., Inc., G. W., Bristol, R. I.
QS—Separators, drains, eliminators. Quality Specialty Co., Inc., Camden, N. J.
Q-T—Sheets and Boards, non-metallic. Celotex Corp., The, Chicago, Ill.
Q-T Ductliner—Insulation, absorbers. Celotex Corp., The, Chicago, Ill.
Q-Chromastic—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Chrome—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Seal—Cement. Quigley Co., Inc., New York, N. Y.
Q-Seal-Damit—Boiler sealing compounds. Quigley Co., Inc., New York, N. Y.
Quaker—Heaters. Mor-Flo Heater Corp., Cleveland, O.
Quantrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Quartzoid—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Queen of Scot—Boilers. National-U.S. Radiator Corp., Johnstown, Pa.
Quick Action—Holders and files. Geneva Mfg. Co., South Elgin, Ill.
Quick-as-Wink—Valves. Hunt Valve Co., Salem, O.
Quiet Duct—Sound absorbers. Industrial Acoustics Co., Inc., New York, N. Y.
Quiet-Flex—Absorbers, hose, noise elimination for cooling towers, joints. Vibration Mountings, Inc., Corona, N. Y.
Quiet Kool—Unitary air conditions. Emerson Radio & Phono Corp., Jersey City, N. J.
Quiet Vent—Sound absorbers. Industrial Acoustics Co., Inc., New York, N. Y.
Quik-Flex—Steam traps. Anderson Co., D. V., The, Div. of International Basic Economy Corp., Cleveland, O.
Quik Heter—Electric heating panels. Adam Electric Co., Frank, St. Louis, Mo.
Quik-Kote—Insulation. Grant Wilson, Inc., Chicago, Ill.
Quik-Lift—Portable hoists. Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Quik-Mask—Gaskets. Brady Co., W. H., Milwaukee, Wis.
Quik-Plates—Nameplates. Brady Co., W. H., Milwaukee, Wis.
Quik-Set—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.
Quik-Temp—Steam traps. Schaub Engineering Co., Fred H., Chicago, Ill.

RBC—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
RB Bases—Noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
RB Integral Fan Bases—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
RB Pressure—Pressure blowers. Western Blower Co., Seattle, Wash.
RB Vibration Rails—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
R & G—Grilles, registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
RH—Unitary air conditioners. McQuay, Inc., Minneapolis, Minn.
RHB Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
R. I.—Unions. Rhode Island Fittings Co., Providence, R. I.
R & I—Cement, insulation, refractories and refractory cement. Refractory & Insulation Corp., New York, N. Y.
R & I Super #3000—Refractories and refractory cement. Refractory & Insulation Corp., New York, N. Y.
R-K—Regulators, valves. Ruggles-Klingemann Mfg. Co., Boston, Mass.
R-M—Packing, rubber tubing. Raybestos-Manhattan, Inc., Passaic, N. J.
R & M All-Weather—Motors. Robbins & Myers, Inc., Springfield, O.
R & M Moyno—Pumps. Robbins & Meyers, Inc., Springfield, O.
RP—Air filters, humidifiers. Research Products Corp., Madison, Wis.
RP Grease—Air grease filters. Research Products Corp., Madison, Wis.
RP Industrial—Air filters. Research Products Corp., Madison, Wis.
RP Super Filter Coat—Oils. Research Products Corp., Madison, Wis.
R/S Controls—Valves. Refrigerating Specialties Co., Chicago, Ill.
RSH Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
"R-Z-U" Jr.—Boilers. Fitzgibbons Boiler Co., Inc., New York, N. Y.
Ra bloc—Treatment. Turco Products, Inc., Los Angeles, Calif.
Racon Boilers—Heaters. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Racon Kit—Coils and panels. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Radiafin—Finned tubing, finned surface. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Radial—Unit coolers. McQuay, Inc., Minneapolis, Minn.
Radiant—Direct radiation. Burnham Corp., Irvington, N. Y.
Radiant—Direct radiation. Utica Radiator Corp., Utica, N. Y.
Radiant Baseboard—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Radiantrim—Radiation. American-Standard Plumbing & Heating Div., New York, N. Y.
RadiaVector—Radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
Radi-Heator—Heaters. Summit Products Co., Uniontown, Pa.
Radiox—Fan housings. Torrington Mfg. Co., The, Torrington, Conn.
Radolite—Cement, refractories. Pyrolite Products Co., Cleveland, O.
Rador—Thermostats. Vapor Heating Corp., Chicago, Ill.
Rajah—Packing. Johns-Manville, New York, N. Y.
Ramiclase—Refractories and refractory cement. Basic Inc., Cleveland, O.
Ramset—Refractories and refractory cement. Basic Inc., Cleveland, O.
Ramex—Drills, regulators, tools. Nielsen, Inc., E. V., Stamford, Conn.
Ranarex—Analyzers, indicators, recorders. Permutit Co., A Div. of Pfaudler Permutit, Inc., New York, N. Y.
Rancho—Propeller fans. Belco Industries, Inc., St. Louis, Mo.
Rangaire—Refrigerating condensers, unitary air conditioners. Cobell Industries, Inc., Cleburne, Tex.
Range—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Rangefinder—Transmitters. Automatic Control Co., St. Paul, Minn.
Rannex—Indicators. Permutit Co., The, A. Div. of Pfaudler Permutit, Inc., New York, N. Y.
Rapid—Oil coolers. Bell & Gossett Co., Morton Grove, Ill.
Rapiduction—Pipe cutting machines. Oster Mfg. Co., Wickliffe, O.
Rapiduction Jr.—Pipe cutting and threading machines. Oster Mfg. Co., Wickliffe, O.
Ratex—Speed changers. Custanite Corp., Brooklyn, N. Y.
Rationotor—Gear—motors. Boston Gear Works, Quincy, Mass.
Ratogate—Valves. Fischer & Porter Co., Hatboro, Pa.
Ratosight—Alarms, flow switches. Fischer & Porter Co., Hatboro, Pa.
Ray-Bond—Adhesives for insulation other than pipe. Raybestos-Manhattan, Inc., Passaic, N. J.
Raydiant—Radiation. Weil-McLain Co., Michigan City, Ind.

Rayduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.

Ray-Vec—Electric heating panels. Electrend Products Corp., St. Joseph, Mich.

Readi-Fin—Tubing. Reading Tube Corp., New York, N. Y.

Reading—Fittings, valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading Pa.

Ready Heat—Electric heating cable. Cox & Co., Inc., New York, N. Y.

Ready-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Realwear—Pumps. Warren Pumps, Inc., Warren, Mass.

Recipro Saw—Electric portable saws. Skil Corp., Chicago, Ill.

Reco—Steam convertors, heat exchangers, headers, heaters, preheaters, tanks, fuel economizers, separators. Richmond Engineering Co., Richmond, Va.

Reco—Controllers and starters, motors, coils, water filters. Reynolds Electric Co., River Grove, Ill.

Reco-Radi-Aire—Fans. Reynolds Electric Co., River Grove, Ill.

Record-O-Stat—Recorder-controllers. Johnson Service Co., Milwaukee, Wis.

Rectilinear—Burners. Webster Engineering Co., Tulsa. Okla.

Red-Band—Pipe nipples. Star Tubular Products Co., Chicago, Ill.

Red Cap—Ventilators. Warner Ventilator Co., La Grange. Ind

Red Devil—Adhesives, furnace, and pipe joint cement. Pecora Inc., Philadelphia, Pa.

Red Diamond—Refrigerants, welders. General Dynamics Corp., Liquid Carbonic Div., Chicago, Ill.

Red Head—Tongs. Billings & Spencer Co., Hartford, Conn.

Redi-Bends—Coils. Capitol Mfg. Co., Div. of Harsco Corp., Columbus, O.

Redi-Return—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

Redi-Vac—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

Red-Reading-Mercury—Hygrometers, psychrometers, thermometers. Palmer Thermometers, Inc., Cincinnati, O.

Red Seal—Gaskets. Chicago Gasket Co., Chicago Ill.

Red Socket—Wrenches. Lowell Wrench Co., Worcester, Mass.

Red Top—Thermostats. H-B Instrument Co., Philadelphia, Pa.

Red Top—Insulation. United States Gypsum Co., Chicago, Ill.

Red Top—Hangers and supports. Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.

Red Top—Valves. Beacon Brass Co., Waltham, Mass.

Reductors—Reducers. Boston Gear Works, Quincy, Mass.

Redycote—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.

Refrak—Burners. Selas Corp. of America, Dresher, Pa.

Refrigerated Kooler-Aire—Unitary air conditioners. United States Air Conditioning Corp., Delaware, O.

Refrigifilter—Refrigerant dehydrators, filters. Hankison Corp., Canonsburg, Pa.

Rego—Regulators, torches, welding and cutting apparatus. National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.

ReGalv—Coatings. Rotometals, San Francisco, Calif

Relatrol—Heating systems. Automatic Timing & Controls, Inc., King of Prussia, Pa.

Reliance—Belting, packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.

Reliance—Filters and regulators. American Meter Co., Inc., Philadelphia, Pa.

Remotaire—Unitary air conditioners. American Standard Plumbing & Heating Div., New York, N. Y.

Renewo—Valves, boiler gage cocks. Lunkenheimer Co., Cincinnati, O.

Renu-Glas—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Renu-Vent—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Rep—Boiler Compounds. Kenite Laboratory, Madison N. J.

Reps—Extractors. Walton Co., Hartford, Conn

Research—Belting. Graton & Knight Co Worcester, Mass.

Return-Aire—Humidifiers. HERRmidifier Co. Lancaster, Pa.

Revent—Valves. Beacon Brass Co., Waltham Mass.

Revolving—Heaters. Wing Mfg. Co., L. J., New York, N. Y.

Revolving—Ventilators. Burt Mfg. Co., Akron, O

Rex—Chain drives, coal and ash conveyors, couplings, nozzles, bearings, pumps. Chain Belt Co., Milwaukee, Wis.

Rex—Heaters. Cleveland Heaters Co., Cleveland, O.

Rex—Fans, wheels. Air Controls, Inc.; Div. of Cleveland Heater Co., Cleveland, O.

RexAir—Burners, furnaces. Reif-Rexoil, Inc., Buffalo, N. Y.

Rexarc—Electrodes, positioners and welders, welding compounds, solder. Sight Feed Generator Co., West Alexandria, O.

Rex-Flex—Hose, and tubing. Flexonics Corp., Maywood, Ill.

Rexglas—Water heaters. The Cleveland Heater Co., Cleveland, O.

RexHeat—Heaters. Reif-Rexoil, Inc., Buffalo, N. Y.

RexPak—Boilers. Reif-Rexoil, Inc., Buffalo N. Y.

Rexrust—Protective coatings. Continental Products Co., Euclid, O.

Rex-Tube—Duct connections, duct fittings, hose, and tubing. Flexonics Corp., Maywood, Ill.

Rex-Weld—Hose and tubing. Flexonics Corp., Maywood, Ill.

Rhinamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.

Rhino—Caulking and sealing compounds. Pecora Inc., Philadelphia, Pa.

Ribbon Heat—Electric heating cable. Cox & Co., Inc., New York, N. Y.

Richducts—Ducts and duct fittings. Richkraft Co., Chicago, Ill.

Richflex—Vapor barriers, insulation. Richkraft Co., Chicago, Ill.

Richfoil—Insulation. Richkraft Co., Chicago Ill.

Richlite—Vapor barriers. Richkraft Co., Chicago, Ill.

Ridgevent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Ridgid—Pipe cutting machines, pipe cutting oil, drives, extractors, stocks & dies, stands, wrenches, cutters, chasers, reamers, vises Ridge Tool Co., Elyria, O.

Ridgoilr—Oiler unit. Ridge Tool Co., Elyria, O.

Rifco—Unions. Rhode Island Fittings Co., Providence, R. I.

Riflex—Vibration absorbers. United Metal Hose Co., Inc., Long Island City, N. Y.

Rigidon—Pipe, ducts, fans, hoods. Heil Process Equipment Corp., Cleveland, O.

Rigid-Tex-Metals—Sheets. Rigidized Metals Corp., Buffalo, N. Y.

Rigivin—Plastic pipe, fans, hoods. Heil Process Equipment Corp., Cleveland, O.

Rihco—Humidifiers. R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.

Rincontrol—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.

Rimcor—Controls, indicator-controllers, smoke alarms, regulators, systems. Reliance Instrument Mfg. Corp., Glen Cove, Long Island N. Y.

Ring-Tite—Couplings. Johns-Manville, New York, N. Y.

Ripple-Fin—Cooling and heating surface. McQuay, Inc., Minneapolis, Minn.

Risselt—Air eliminators. Morheat Corp., Cincinnati, O.

Rite-Flo—Diffusers, grilles, registers. Lenly Mfg. Co., Inc., Los Angeles, Calif.

Riviera—Air conditioning units. Webster & Co., Warren, Camden, N. J.

Robot—Switches. Miller-Harris Instrument Co., Milwaukee, Wis.

Robot-Eye—Regulators, smoke alarms. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.

Rock cork—Pipe insulation. Johns-Manville, New York, N. Y.

Rocksil—Insulation. North American Asbestos Corp., Chicago, Ill.

Rocop—Heaters. Rome-Turney Radiator Co., Rome, N. Y.

Rod-Pak—Electrodes. Marquette Mfg. Co., Inc., Minneapolis, Minn.

Ro-Fin—Tubing. Rome-Turney Radiator Co., Rome, N. Y.

Ro-Flo—Compressors, pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Rokide—Protective coatings for metals. Norton Co., Worcester, Mass.

Rolagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.

Rol-Air—Tools. Imperial Brass Mfg. Co., Chicago, Ill.

Roll-a-Bend—Pipe benders. Radiant Devices, St. Louis, Mo.

Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.

Rolled-Rite—Angles, bars, beams, channels and tees; blow pipe fittings. Chicago Metal Mfg. Co., Chicago, Ill.

Roll Matric—Electrodes. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Roll-O-Matic—Filters. American Air Filter Co., Inc., Louisville, Ky.

Rollotron—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Rolo-Bend—Tubing benders. Wilson Mfg. Co., Memphis, Tenn.

Rolo-Flair—Tools. Wilson Mfg. Co., Memphis, Tenn.

Roomaire—Air conditioning units. Young Radiator Co., Racine, Wis.

Roommate—Air conditioning units. Nesbitt, Inc., John J., Philadelphia, Pa.

Rotameter—Flow meters. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

Rotary Union—Pipe joints. Perfecting Service Co., Charlotte, N. C.

Rotary Valvent—Ventilators. Swartwout Fabricators, Inc., Kokomo, Ind.

Rotex—Pumps. Warren Pumps, Inc., Warren, Mass.

Roto-Clone—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.

Roto-Cup—Gas and oil burners. Best Combustion Equipment Co., Inc., W. N., Little Ferry, N. J.

Rotocure—Belting. Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.

Rotodip—Chemical feeders. B-I-F Industries, Omega Div., Providence, R. I.

Rotograte Stoker—Stokers. Detroit Stoker Co., Monroe, Mich.

Roto-Hammers—Electric portable hammers. Skil Corp., Chicago, Ill.

Rotojet—Spray nozzles. Binks Mfg. Co., Chicago, Ill.

Roto-louvre—Dryers. Link-Belt Co., Chicago.

Rotomet—Solder and fluxes. Rotometals, San Francisco, Calif.

Rotometric—Solder and fluxes. Rotometals, San Francisco, Calif.

Roto-Mold—Packing. Linear Inc., Philadelphia, Pa.

Rotonetic—Gas burners. Webster Engineering Co., Tulsa, Okla.

RotoStoker—Stokers. Detroit Stoker Co., Monroe, Mich.

RotoStoker—Type C-C—Stokers. Detroit Stoker Co., Monroe, Mich.

Roto-Torq—Tools. Richmont, Inc., Monrovia, Calif.

Roto-trol—Liquid pressure regulators, alarms, indicators, and switches. Healy Ruff Co., St. Paul, Minn.

Roto-Vent—Ventilators. Hudson Mfg. Co., H. D., Chicago, Ill.

Roto-Wash—Booths. Griffin & Co., Louisville, Ky.

Rotrkore—Masonry drills. Star Expansion Industries, Mountainville, N. Y.

Rotrtwist—Drills. Star Expansion Industries Corp., Mountainville, N. Y.

Ro-Twin—Air compressors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Round Wound—Transformers. Line Material Industries, McGraw-Edison Co., Milwaukee, Wis.

Roust-A-Bout—Pipe repair clamps. Victaulic Co. of America, Elizabeth, N. J.

Roxaprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Royal—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Royal Clipper—Cutters and shears. M-M-A, Inc., Lancaster, Pa.

Royal, The—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Rubalt—Enamels and lacquers, protective coatings, high temperature paint. Hague & Co., Inc., Alfred, Div. of Lacquer & Chemical Corp., Brooklyn, N. Y.

Rubbernek—Steel tube fittings. Chicago Forging and Mfg. Co., Chicago, Ill.

Rubbon—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Rub-R-Lon—Enamels and lacquers. Acorn Refining Co., Cleveland, O.

Rubyfluid—Solder. Ruby Chemical Co., Columbus, O.

Rumaco—Pump-motor units. Ruthman Machinery Co., Cincinnati, O.

Rusco—Window panels, canopies. Russell Co., F. C., The, Columbiana, O.

Rusco Prime—Windows. Russell Co., F. C., The, Columbiana, O.

Rust Bloc No. 20—Coatings. Turco Products, Inc., Los Angeles, Calif.

Rustbuster—Cleaning compounds, water treatment. Cannon Chemical Co., Inc., Cambridge, Mass.

Rust Eradicator—Water treatment. North American Mogul Products Co., The, Cleveland, O.

Rust Evade—Coatings. Turco Products, Inc., Los Angeles, Calif.

Rustikote—Protective coatings for metals. Tropical Paint Co., Cleveland, O.

Rust Raider—Compounds. Radiator Specialty Co., Charlotte, N. C.

Rustrem—Protective coatings. Speco, Inc., Cleveland, O.

Rust Remover—Compounds. Turco Products, Inc., Los Angeles, Calif.

Rust Veto—Protective Coatings. E. F. Houghton & Co., Philadelphia, Pa.

S-A—Conveyors, feeders. Stephens-Adamson Mfg. Co., Aurora, Ill.

SA—Valves. Lunkenheimer Co., Cincinnati, O.

SC—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.

SCM—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.

S.F.E.—Insulation. Standard Fuel Engineering Co., Detroit, Mich.
SF—Integral Fan Base—Vibration bases. Vibration Mountings, Inc., Corona, N. Y.
SHB Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
S 1—Analyzers, indicators, recorders and systems. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
SL—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.
S & P—Burners, governors, preheaters, strainers, fuel oil units, valves. Staples & Pfeiffer, San Francisco, Calif.
S. R. P. 75—Protective coatings. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
SRP 87—Protective coatings, paint. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
SSS—Belting. Goodall Rubber Co., Trenton, N. J.
SSS Selfdril Shield Strikr-Studs-Pins—Expansion bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Sabanol—Fuel oil treatment. American Sand-Banum Co., Inc., Merrick, N. Y.
Sabrex—Protective coatings. Navan Products, Inc., El Segundo, Calif.
Saco — Speed reducers. Stephens-Adamson Mfg. Co., Aurora, Ill.
Safe-Fill—Connectors. Gasoilair Equipment Co., New Haven, Conn.
Safe Guard—Fuel oil preheaters. Alstrom Corp., New York, N. Y.
Safe-T-Aire—Air sterilizing units, and lamps. Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.
Safetak—Adhesives. Cain Mfg. Inc., Birmingham, Ala.
Safe-T-Submersion—Boilers, burners, heaters, systems. Stout & Sons, David, St. Louis, Mo.
Safety Pull—Hoists. Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Safeway Load-Lift—Trucks. American Pulley Co., The, Philadelphia, Pa.
Saf-T-Edge—Pipe hangers and supports. Western Wire Products Co., St. Louis, Mo.
Saint Louis—Stokers. Ormsby-Osterman, Inc., St. Louis, Mo.
Sairset—Cement, refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Sal Brick—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Samco—Incinerators. Syrall Mfg. Co., Syracuse, N. Y.
Sanitile—Enamels and lacquers. Master Mechanics Co., Cleveland, O.
Sanitizer—Treatment. Oakite Products, Inc., New York, N. Y.
Santobrite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santocel—Insulation. Monsanto Chemical Co., St. Louis, Mo.
Santolene—Fuel oil treatment. Monsanto Chemical Co., St. Louis, Mo.
Santosite—Water treatment. Monstanto Chemical Co., St. Louis, Mo.
Saraloy—Gaskets, packing. Saran Lined Pipe Co., Ferndale, Mich.
Sarancote—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Sarine—Treatment. Berna Corp., Garwood, N. J.
Sarine-Amid—Treatment. Berna Corp., Garwood, N. J.
Satanite—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Saunders—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Saunders—Pipe cutters. Erie Tool Works, Erie, Pa.
Saunders—Diaphragm valves. Grinnell Co., Inc., Providence, R. I.
Saunders-Barnes—Pipe cutters. American Pipe Tool Co., Chicago, Ill.
Saunders Patent—Valves. Hills-McCanna Co., Chicago, Ill.
Sav-A-Tank—Fuel oil treatment. Sudbury Laboratory, South Sudbury, Mass.
Sawzall—Tools. Milwaukee Electric Tool Corp., Milwaukee, Wis.
Scale-Ban—Compounds. Parke-Hill Chemical Corp., Mt. Vernon, N. Y.
Scale-Solve—Compounds, treatment. Gotham Refining Chemical Co., New York, N. Y.
Scalex—Cleaning compounds, chemical treatment. Lester Laboratories, Inc., Atlanta, Ga.
Scav-Ox—Water treatment. Olin Mathieson Chemical Corp., Chemicals Div., Baltimore, Md.
Scentinel—Compounds. Ampion Corp., Long Island City, N. Y.
Schmidt—Torches. Minn-Kota Foundry & Mfg. Co., Moorhead, Minn.
School Master—Unit ventilators. Rittling Corp., The, Buffalo, N. Y.
Schwan—Gas burners. Jamieson Mfg. Co., Dallas, Texas.
Scoop-Rail—Scoops, vanes. Cain Mfg. Inc., Birmingham, Ala.
Scotch—Adhesive tape. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Scotchrap—Adhesives, underground pipe insulation, adhesive tape, pipe wrap. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Scott Foam—Air filters. Foamade Industries, Oak Park, Mich.
Scout—Water heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Screw King—Reducers and increasers. American Pulley Co., The, Philadelphia, Pa.
Screw-Seal—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Scroll-Aire—Air heaters. Newcomb-Detroit Co., Detroit, Mich.
Scrugun—Tools. Black & Decker Mfg. Co., The, Towson, Md.
Scruin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Scru-peller—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Sea Lion—Leather belting. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Sea Rings—Asbestos packing. Johns-Manville, New York, N. Y.
Sealastic—Fittings, leak detectors, leak testers. Chicago Forging and Mfg. Co., Chicago, Ill.
Sealeak—Compounds. Ampion Corp., Long Island City, N. Y.
Sealed Life—V-Belts. Dodge Mfg. Corp., Mishawaka, Ind.
Sealfas—Adhesives, vapor barriers. Foster Co., Benjamin, Philadelphia, Pa.
Sealmaster—Boiler cleaning and sealing compounds. Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Sealmore—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Sealon—Tank linings. Knight, Maurice A., Akron, O.
Seal-Rite—Cement and compounds. Macksons Co., New York, N. Y.
Seal Saver—Packing. Greene, Tweed & Co., North Wales, Pa.
Seal Tight—Frames for holding panel type air filters. George Evans Corp., Moline, Ill.
Seal-Tite—Ducts and duct fittings, pipe and fittings. Williamson Co., The, Cincinnati, O.
Sealtrode—Switches. Chicago Pump Co., Subsid. of Food Machinery & Chemical Corp., Chicago, Ill.
Seasonmaker—Unitary air conditioners. McQuay, Inc., Minneapolis, Minn.
Seasonmaster—Unitary air conditioners. McQuay, Inc., Minneapolis, Minn.
Seazonaire—Unitary air conditioners. Marlo Coil Co., St. Louis, Mo.
See-All—Sight glasses for pipe lines. Sporlan Valve Co., St. Louis, Mo.
Seigelite—Gaskets. Johns-Manville, New York.
Seilon—Plastic sheets. Seiberling Rubber Co., Newcomerstown, O.
Selectaflow—Valves. American-Standard Detroit Controls Div., Detroit, Mich.
Selectair—Unitary air conditioners. Johnson Co., S. T., Oakland, Calif.
Select-A-Spede—Speed changers. Allis Co., Louis, The, Milwaukee, Wis.
Selectofoam—Plastics, powders and resins. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Selectric—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Selectrol—Regulators, switches. Automatic Control Co., St. Paul, Minn.
Selectron—Plastics, powders and resins. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Selflube—Sleeve bearings. Keystone Carbon Co., Inc., St. Marys, Pa.
Sel-Lok—Parts for heating and air conditioning equipment. Standard Pressed Steel Co., Jenkintown, Pa.
Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.
Sensatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Sensitrol—Relays. Daystrom-Weston Sales Div., Daystrom, Inc., Newark, N. J.
Sentinel—Valves. McRae Specialty Co., Don, Glendale, Calif.
Sentry—Alarms, smoke indicators, smoke recorders. Edwards, L. V., Rockville Center, N. Y.
Sentry—Valves. Coppus Engineering Corp., Worcester, Mass.
Sep-return—Separators. Wabash Corp., Chicago, Ill.
Serval—Gaskets. Chicago Gasket Co., Chicago, Ill.
Service—Packing. Johns-Manville, New York.
Servicecoat—Enamels and lacquers. Debevoise Co., The, Brooklyn, N. Y.
Sesure—Gages. Yarnall-Waring Co., Philadelphia, Pa.
Sever-All—Tools. Allison-Campbell Div. of American Chain & Cable Co., Inc., Bridgeport, Conn.
Severn—Boilers. American-Standard Plumbing & Heating Div., New York, N. Y.
Shafconaire—Unit heaters, fans. OverHead Heaters, Inc., Detroit, Mich.
Shafer—Bearings. Chain Belt Co., Milwaukee, Wis.
Shaft King—Reducers, drives. American Pulley Co., The, Philadelphia, Pa.
SHALCO—Aluminum sheets. Mueller Brass Co., Port Huron, Mich.
Shawco—Bends, headers. Shaw Co., Benjamin F., Wilmington, Del.
Shear-Flex—Bases and pads, absorbers, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
Shear-Seal—Valves. Barksdale Valves, Los Angeles, Calif.
Shelby—Tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Shield-Arc—Electrodes, arc welders. Lincoln Electric Co., Cleveland, O.
Ship-Heaters—Boilers. Way-Wolff Associates, Inc., Long Island City, N. Y.
Shockmounts—Bases and pads. Lord Mfg. Co., Erie, Pa.
SHOKSTOP—Absorbers. Wade Mfg. Co., Elgin, Ill.
Shoktrol—Adsorbers. Zurn Industries, Inc., Erie, Pa.
Shone—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Shop King—Welders. Precision Welder Mfg. Co., Chicago, Ill.
Shopmate—Drills. Portable Electric Tools, Inc., Chicago, Ill.
Shuntflo—Meters. Builders-Providence Div., B-I-F Industries Inc., Providence, R. I.
Shure-Drive—Electric portable hammers. Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn.
Shure-Set—Tools. Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., New Haven, Conn.
Shur-Flo—Switches. Hays Mfg. Co., Erie, Pa.
Shur-Flo—Fans. Walker Mfg. & Sales Co., St. Joseph, Mo.
Shur-Grip—Tools. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Shuttle Break—Switches. Adam Electric Co., Frank, St. Louis, Mo.
Shut-O-Vent—Louvers and shutters. Reed Unit-Fans, Inc., New Orleans, La.
Sigma—Air diffusers, perforated panels. Wakefield Co., The, Vermilion, O.
Sigma—Welders. Linde Co., Div. of Union Carbide Corp., New York, N. Y.
Silastic—Packing. Dow Corning Corp., Midland, Mich.
Sil Bond—Solder. United Wire & Supply Corp., Cranston, R. I.
Silence Service—Noise elimination. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Silensair—Duct insulation, absorbers, noise elimination for cooling towers. Sound Reduction Corp., East Hartford, Conn.
Silentair—Air diffusers. General Air Products Corp., Cedar Grove, N. J.
Silent-Aire—Fans, propeller. Swift Mfg. Co. Inc., Detroit, Mich.
Silent-Auburn—Burners, heaters, air conditioning units. Auburn Burner Co., Auburn, Ind.
Silent-Breeze—Fans, louvers and shutters, window and ventilator units. Meir Electric. Indianapolis, Ind.
Silent Chain—Drives. Link-Belt Co., Chicago, Ill.
Silent Duct—Connections. Elgen Mfg. Corp., Long Island City, N. Y.
Silent Knight—Valves. White-Rodgers Co., St. Louis, Mo.
Silentride—V belts. Zatko Metal Products Co., Euclid, O.
Siltentube—Duct insulation, absorbers, noise elimination for cooling towers. Sound Reduction Corp., East Hartford, Conn.
Silent Vent—Ventilators. Detroit Blower Corp., Franklin Park, Ill.
Sil Flux—Solder. United Wire & Supply Corp., Cranston, R. I.
Sil-Fos—Solder. Handy & Harman, New York, N. Y.
Silica Gel—Refrigerant dehydrators. Eagle Chemical Co., Inc., Mobile, Ala.
Silicon-Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Silicone—Protective coatings. Dow Corning Corp., Midland, Mich.
Silimite—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sillimanite—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati.
Sill-Line—Radiation. Nesbitt, Inc., John J., Philadelphia, Pa.
Siloo—Solvents, fuel oil treatment. Petroleum Solvents Corp., New York, N. Y.
Sil-rayvector—Baseboard radiation. Radiant-Ray Radiation, Inc., Newington, Conn.
Siltube—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Silvaloy—Solder. American Platinum & Silver Div., Engelhard Industries, Inc., Newark, N. J.
Silver-brite Roller Chain—Drives. Link-Belt Co., Chicago, Ill.
Silver Comet—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Silver Star—Torches, welding and cutting apparatus. Smith Welding Equipment Corp., Minneapolis Minn.
Silver Steel—Tools. Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.

Silverstreak—Drives. Link-Belt Co., Chicago, Ill.

Silver Streak—Blower wheels. Viking Air Products Div., National-U. S. Radiator Corp., Cleveland, O.

Silver Stream—Spray nozzles. Skinner Irrigation Co., Troy, O.

Silvertop—Eliminators, traps. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.

Silver-Weld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

SilWeld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

Simplex—Gages. Viking Pump Co., Cedar Falls, Ia.

Simplex—Regulators. Bell & Gossett Co., Morton Grove, Ill.

Simplex—Wrenches. Lowell Wrench Co., Worcester, Mass.

Sim-ply-trol—Indicator-controllers, regulators. Assembly Products, Inc., Chesterland, O.

Simsestos—Packing. Sims Pump Valve Co., Hoboken, N. J.

Simsite—Packing. Sims Pump Valve Co., Hoboken, N. J.

Sim-Trol—Controls, combustion regulators. Simplex Mfg. Co., Fond du Lac, Wis.

Sine Switch—Switches. Texas Instrument Inc., Metals & Controls Div., Attleboro, Mass.

Single-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.

Sioux—Electric drills, grinders and grinding wheels, wrenches, saws, shafts. Albertson & Co., Inc., Sioux City, Ia.

Siphon—Ventilators. Octagon Ventilator Co., Chicago, Ill.

Sirocco—Blowers, fans. American-Standard Industrial Div., Detroit, Mich.

Skimmer—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.

Skip-Tooth—Dies. Nye Tool Co., Chicago, Ill.

Sky-Blast—Roof fan ventilators. Propellair Div., Robbins & Myers Inc., Springfield, O.

Skyline—Ventilators. Arex Co., Chicago, Ill.

Skymaster—Ventilators. Acme Engineering & Mfg. Corp., Muskogee, Okla.

Sleeveline—Valves. Duriron Co., Inc., The, Dayton, O.

Sleevoil—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.

Slenderizer—Direct radiation. Burnham Corp., Irvington, N. Y.

Slim-Line—Baseboard radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.

Slip-On—Pipe insulation. Taft-Jenkins Co., Inc., Holyoke, Mass.

Slo-Speed—Drives, motor gears. Sterling Electric Motors, Inc., Los Angeles, Calif.

Sludge-Ban—Compounds. Parke-Hill Chemical Corp., Mt. Vernon, N. Y.

Sludgemaster—Fuel oil treatment. Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.

Sludge Solvent No. 32—Fuel oil treatment. Montgomery Chemical Co., Jenkintown, Pa.

Sludgit—Fuel oil treatment. Anderson Chemical Co., Inc., Macon, Ga.

Sludgout—Fuel oil treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.

Slugin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.

Smith-Clamp—Pipe repair clamps. Pipe Line Development Co., Cleveland, O.

Smith-Dolan—Electric preheaters and stress relievers Electric Arc, Inc., Newark, N. J.

Smith Split-Coupling—Pipe couplings. Pipe Line Development Co., Cleveland, O.

Smith Split-Sleeve—Pipe repair clamps. Pipe Line Development Co., Cleveland, O.

Smog-Free—Odor absorbers. Radex Corp., Chicago, Ill.

Smoke-Trip—Ventilators. Propellair Div., Robbins & Myers, Inc., Springfield, O.

Smokey—Guns for testing air movement. Design Engineers, Rockford, Ill.

Snapin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.

Snaplok—Gas vent and flue pipe and fittings. Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.

Sno-Breeze—Air Conditioning units. Palmer Mfg. Corp., Phoenix, Ariz.

Snip-It—Air filters. C.L.B. Co., Houston, Tex.

Snug—Radiation. Well-McLain Co., Michigan City, Ind.

Sockolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.

Sod-R-Braze—Torches. National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.

Sof Tite—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.

SofTite—Sheets. Wheeling Steel Corp., Wheeling, W. Va.

Softweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Sola-Flex—Pipe joints. Solar Aircraft Co., San Diego, Calif.

Solar Flame—Burners. National-U.S. Radiator Corp., Johnstown, Pa.

Solar Screens—Sun reflecting screens. Federal Seaboard Terra Cotta Corp., New York, N. Y.

Solray—Radiation. Weil-McLain Co., Michigan City, Ind.

Sol-vet—Cleaning compounds, water treatment. Anderson-Stolz Corp., Kansas City, Mo.

Solvex—Cleaning compounds. Chemical Solvent Co., Birmingham, Ala.

Solvo-Rust—Solvent. Permatex Co., Inc., Long Island, N. Y.

Sonblaster—Pipe cleaning machines. Narda Ultrasonics Corp., Westbury, Long Island, N. Y.

Sonderglass—Glasses. Chesterton Co., A. W. Everett, Mass.

Sonic-Ray—Heaters. Bica Co., Girard, O.

Sonoairduct—Ducts. Sonoco Products Co., Construction Products Div., Hartsville, S. C.

Son-No-Mar—Enamels and lacquers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.

Sonobond—Solder. Aeroprojects, Inc., West Chester, Pa.

Sonotard—Concrete densifiers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.

Sootspray—Soot destroyers. Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.

Sonotrol Curb—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Sorbead—Refrigerant dehydrators. Mobil Oil Co., Inc., New York, N. Y.

So-Soft—Softeners. Stover Water Softener Co., St. Charles, Ill.

So-Soft Amatic—Water softeners. Stover Water Softener Co., St. Charles, Ill.

Soundliner—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.

Sound Metal—Noise elimination. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.

Soundscope—Testers. Marsh Instruments Co., Div. of Colorado Oil & Gas Corp., Skokie, Ill.

Soundscope—Indicators. Mine Safety Appliances Co., Pittsburgh, Pa.

Sound Stream—Absorbers. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.

Sound-Zorbers—Vibration absorbers. Finn & Co., Inc., T. R., Hawthorne, N. J.

Sovereign—Packing. Darcoid Co., Inc., New York, N. Y.

Spacemaster—Heating and ventilating units. The Rittling Corp., Buffalo, N. Y.

Space Saver—Heaters. Payne Company, La Puente, Calif.

Spang—Underground piping conduit, pipe couplings, steel pipe, steel tubing. Tubular Div., The National Supply Co., Pittsburgh, Pa.

Sparktrodes—Electrodes. Dielectric Products Co., Inc., Jersey City, N. J.

Spartan—Packing, belting. Graton & Knight Co., Worcester, Mass.

Spasaver—Cooler units. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.

Spearhead—Gasket cutters. Zimmerman Packing, Cincinnati, O.

Special X—Solder. Chemical Specialty Div., Shooz Polish Mfg. Co., Milwaukee, Wis.

Spectronic-20—Colorimeters. Bausch & Lomb Optical Co., Rochester, N. Y.

Spe-D-Flar—Tools. Engesser & Co., William L., El Monte, Calif.

Speedaire—Reducers. Cleveland Worm & Gear Co., Cleveland, O.

Speedaire—Compressors. Dayton Electric Mfg. Co., Chicago, Ill.

Speed Drills—Drills. Speedway Mfg. Co., Div. of Thor Power Tool Co., La Grange Park, Ill.

Speed Grinders—Grinders. Speedway Mfg. Co., Div. of Thor Power Tool Co., La Grange Park, Ill.

Speedomax—Indicator and recorder-controllers, solar sensing instruments, recorders, thermometers. Leeds & Northrup Co., Philadelphia, Pa.

Speed Primer—Pumps. Chain Belt Co., Milwaukee, Wis.

Speed Rail—Pipe fittings. Hollaender Mfg. Co., Cincinnati, O.

Speed-Rex—Protective coatings. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.

Speed Saw—Electric saws. Speedway Mfg. Co., Div. of Thor Power Tool Co., La Grange Park, Ill.

Speed-Thru—Pipe pushers, stocks and dies. Mercury Hydraulics, Inc., Denver, Colo.

Speed-Trol—Changers, drives. Sterling Electric Motors, Inc., Los Angeles, Calif.

Speed Variator—Changers. Cleveland Worm and Gear Co., Cleveland, O.

Speedweld—Spot welders. Nielsen, Inc., E. V., Stamford, Conn.

Speedy—Clamps, cutters, packing, plugs, tools, wrenches. Chicago Specialty Mfg. Co., Chicago, Ill.

Speedy-Cal—Nameplates. North Shore Nameplate Inc., Bayside, N. Y.

Speedylectric—Boilers, generators, superheaters. Pantex Mfg. Corp., Pawtucket, R. I.

Speedy-Marx—Identification markers. North Shore Nameplate Inc., Bayside, N. Y.

Speedytherm—Boilers. Pantex Mfg. Corp., Pawtucket, R. I.

Spekaluminite—Coatings. Special Chemicals Corp., Ossining, N. Y.

Spekleen—Compounds. Special Chemicals Corp., Ossining, N. Y.

Spher-Align—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.

Sphero—Ball type and Blow-off valves. Fairbanks Co., New York, N. Y.

Spicymist—Air refreshening compounds. Acme Chemical Co., Milwaukee, Wis.

Spinner—Gravity ventilators. Warner Ventilator Co., LaGrange, Ind.

Spinner—Ventilators. Inland Steel Products Co., Milwaukee, Wis.

Spin-seat—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.

Spintex—Building and duct insulation. Johns-Manville, New York, N. Y.

Spiral Lockseam—Spiral welded ducts. United Sheet Metal Co., Inc., Columbus, O.

Spiralweld—Nickel plated pipe. Taylor Forge & Pipe Wks., Chicago, Ill.

Spiratube—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.

Spiraweld—Pipes. Naylor Pipe Co., Chicago.

Spiro—Heaters. Stout & Sons, David, St. Louis, Mo.

Spirodome—Spray nozzles. Fluor Products Co., Santa Rosa, Calif.

Spi-Rol-Fin—Radiation. Edwards Engineering Corp., Pompton Plains, N. J.

Spirotallic—Gaskets. Johns-Manville, New York, N. Y.

Spirovane—Fans. Western Blower Co., Seattle, Wash.

Sponge-Dortite—Tape for sealing joints. Durkee-Atwood Co., Minneapolis, Minn.

Spongex—Bases and pads, gaskets, pipe insulation. B. F. Goodrich Co., Shelton, Conn.

Spotaire—Air conditioning units, heaters. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.

Spra-Chiller—Water chillers. Watkins Co., J. E., Maywood, Ill.

Spraco—Booths, nozzles aftercoolers, humidifiers, regulators, systems, separators, strainers, washers. Spray Engineering Co., Burlington, Mass.

Spra-Rite—Nozzles. Binks Mfg. Co., Chicago.

SpraTower—Cooling Towers. Marley Co., The, Kansas City Mo

Spray-Acoustic—Insulation. Sprayo Flake Co., Chicago, Ill.

Spray-It—Air compressors, viscosimeters. Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.

Spray-Mastic—Protective coatings. Eagle-Picher Co., Cincinnati, O.

Spray Stops—Protective covers. Neirad Industries, Inc., Darien, Conn.

Spraywheel—Air washers. Mountain States Equipment Co., Denver, Colo.

Spring-Flex—Absorbers, bases and pads, hangers, flexible hose, noise elimination for cooling tower. Vibration Mountings, Inc., Corona, N. Y.

Springin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.

Spun steel—Pulleys, sheaves. Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.

Square-Fin—Radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.

Stabilflo—Valves. Foxboro Co., Foxboro, Mass.

Stainlend—Electrodes. Arcos Corp., Philadelphia, Pa.

StainRod—Rods. Eutectic Welding Alloys Corp., Flushing, N. Y.

StainTin—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

StainTrode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

Stainweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Stalostic—Protective coatings. Eagle-Picher Co., Cincinnati, O.

Standard—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.

Standard—Ventilators. Burt Mfg. Co., Akron, O.

Standard Thrift—Pipe hangers and supports. Western Wire Products Co., St. Louis, Mo.

Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.

Star-Kimble—Electric motors. Safety Electrical Equipment Corp., New Haven, Conn.

Star-O-Zone—Ozone apparatus. Norwood Associated Engineers Inc., Springfield, Mass.

Statick—Ventilators. Hirschman-Pohle Co., Inc., Le Roy, N. Y.

Stat-O-Seal—Seals. Parker Seal Co., Culver City, Calif.

Staxauster—Roof ventilators, fans. Allen Cooler & Ventilator, Inc., Rochester, Mich.

Staynew—Filters, silencers. Dollinger Corp., Rochester, N. Y.

Stazin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.

Stazon—Caulking & Cleaning compounds. Plastic Products Co., Detroit, Mich.

Steam-Pak—Boilers. York-Shipley, Inc., York, Pa.

Steam-Pakette—Boilers. York-Shipley, Inc., York, Pa.

Steelarc—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Steelbestos—Metal sheets. Bowman Steel Corp., Pittsburgh, Pa.
Steelfin—Surface. New York Blower Co., Chicago, Ill.
Steelflex—Couplings. Falk Corp., Milwaukee.
Steel-Pak—Radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
SteelTectic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Steelweld—Brakes, power shears. Cleveland Crane & Eng. Co., Wickliffe, O.
Stemco—Thermostats. Stevens Mfg. Co., Inc., Mansfield, O.
Sterilamp—Lamps. Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Steritron—Water treatment, water sterilizing units. Hanovia Lamp Div., Engelhard Industries, Inc., Newark, N. J.
Sterlco—Pumps, strainers, regulators, traps, valves. Sterling, Inc., Milwaukee.
Sterling-Magic—Non-metal hose. New York Belting & Packing Co., Passaic, N. J.
Stic-Tite—Cement, insulation. Refractory & Insulation Corp., New York, N. Y.
Stillson Heavy Duty Walco—Wrenches. Walworth Co., New York, N. Y.
Stirling—Boilers. Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Stokerlay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Stonewall—Board and sheets. Ruberoid Co., New York, N. Y.
Storm Shade—Windows. Ingersoll Products Div., Borg-Warner Corp., Chicago, Ill.
Straitflo—Strainers. Hays Mfg. Co., Erie, Pa.
Strand—Grinders and grinding wheels. Franklin Balmar Corp., Baltimore, Md.
Strato-Flair—Tools. Wilson Mfg. Co., Memphis, Tenn.
Streamjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Streamline—Couplings, coils, filters, dehydrators, tubing benders, glasses, hose, plugs, purgers, solder, parts for heating and air conditioning equipment, cutters, fittings, hangers, heat exchangers, manifolds, nipples, pipe line strainers, tubing, unions, valves. Mueller Brass Co., Port Huron, Mich.
Streamlined—Chambers. Green Fire Brick Co., A. P., Mexico, Mo.
Streamliner—Registers. Auer Register Co., Cleveland, O.
Streamliner—Belting. New York Belting & Packing Co., Passaic, N. J.
Strickler—Pipe cutting and threading machines Wachs Co., E. H., The, Chicago, Ill.
Strip-Grip—Protective coatings for metals. Adhesive Products Corp., New York, N. Y.
Strongbarn—Steel sheets. Granite City Steel Co., Granite City, Ill.
Stronghold—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Stubby—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.
Stud-Driver—Fasteners, tools. Remington Arms Co., Inc., Bridgeport, Conn.
Stud-Pins—Bolts, toggle and anchor. Fastway Fasteners, Inc., Lorain, O.
Styrene-Copolymer—Plastic pipe. Vanton Pump & Equipment Corp., Hillside, N. J.
Styrofoam—Insulation. Dow Chemical Co., The, Midland, Mich.
Styropol—Adhesives. Adhesive Products Corp., New York, N. Y.
Subette—Electric motors. Byron Jackson Pumps, Inc., A Subsid. of Borg-Warner Corp., Los Anegeles, Calif.
Submatic—Electric motors. Franklin Electric Co., Inc., Bluffton, Ind.
Submersipool—Electric motors. Franklin Electric Co., Inc., Bluffton, Ind.
Suburban—Radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Sudden Depth—Drill. Paine Co., Addison, Ill.
Sulfran—Oil. Mobil Oil Co., Inc., New York, N. Y.
Sullivan—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Sundial—Radiators. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Sunicut—Oil. Sun Oil Co., Philadelphia, Pa.
Suniso—Refrigeration oil. Sun Oil Co., Philadelphia, Pa.
Sun-Lite-Aire—Sterlizing lamps and units. Sampson Scientific Co., Div. of the Sampson Chemical & Pigment Corp., Chicago, Ill.
Sunnyaire—Heaters. Crane Co., Chicago, Ill.
Sunnybase—Radiation. Crane Co., Chicago Ill.
Sunnyday—Boilers. Crane Co., Chicago, Ill.
Sunnywall—Radiation. Crane Co., Chicago, Ill.
Sunrad—Direct radiation. American-Standard Plumbing & Heating Div., New York, N. Y.
Sunray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Super—Transformers. Union Electric & Mfg. Co., Jersey City, N. J.
Super—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.
Super Air-Van—Wall ventilators. Gallaher Co., The, Omaha, Nebr.
Superbo—Insulation. Carey Mfg. Co., Philip, Cincinnati, O.
Supercutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Super-Diamond—Floor and ceiling plates. Eastern Stainless Steel Corp., Baltimore, Md.
Super Dry-Eye—Refrigerant dehydrators, sight glasses for pipe lines. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Super Dylan—Plastics, powders and resins. Koppers Co., Inc., Pittsburgh, Pa.
Superector—Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Superex—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Super Filter Coat—Adsorbers. Research Products Corp., Madison, Wis.
Superfin—Furnaces, heaters. American Foundry & Furnace Co., Bloomington, Ill.
Super Finish—Insulation. Refractory & Insulation Corp., New York, N. Y.
Super Finish Stic-Tite—Finishing cement insulation. Refractory & Insulation Corp., New York, N. Y.
Super-Flo—Dehydrators, filters. Remco, Inc., Zelienople, Pa.
Superflux—Solder. Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Superheat—Burners. Selas Corp. of America, Dresher, Pa.
Superholder—Tools. Nupla Mfg. Co., Los Angeles, Calif.
Superior—Fans. American Foundry & Furnace Co., Bloomington, Ill.
Superior—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Superior—Meters. Neptune Meter Co., New York, N. Y.
Super Light—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Super Powerhouse—Insulating cement, insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Superratchet—Ratchet Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Super-Saw—Tools, electric saws. RCS Tool Corp., Bloomington, Ill.
Super-Service—Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Super Silvertop—Traps. The V. D. Anderson Co., Div. of International Basic Economy Corp., Cleveland, O
Super "66"—Insulation, cement insulating Eagle-Picher Co., Cincinnati, O.
Super-Seal—Electric motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Super Seal—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.
Supersheat—Gaskets, packing. Greene, Tweed & Co., North Wales, Pa.
Superspun—Cast iron pipe. Combustion Engineering Inc., New York, N. Y.
Supertemp—Insulation. Eagle-Picher Co., Cincinnati, O.
Supertherm—Heating systems. Ross Engineering Div., J. O., Midland-Ross Corp., New York, N. Y.
Super Venturi—Fittings. Taco Heaters, Inc., Cranston, R. I.
Super X—Coatings. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Supplex—Pipe. American Hard Rubber Co., Div. of Amerace Corp., Butler, N. J.
Surector—Water chlorinators. Clayton Mark & Co., Evanston, Ill.
Surefit—Ducts and duct fittings. Henry Furnace Co., Medina, O.
Surefit—Ducts and duct fittings. Olsen Mfg Co., C. A., Elyria, O.
Sure Return—Condensation return pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Sureweld—Electrodes welders National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Surfamax—Pipe line filters. Micro Metallic Corp., Glen Cove, N. Y.
Surgemaster—Boiler cleaning compounds. Stewart-Hall Chemical Corp., Mt. Vernon, N. Y.
Sutco—Electric motors. Sutton Corp., O. A., The, Wichita, Kans.
Sweatflow—Valves. Quality Specialty Co., Inc., Camden, N. J.
Sweepolets—Pipe fittings. Bonney Forge & Tool Wks., Allentown, Pa.
Swif—Penetrant solvent. Hercules Chemical Co., Inc., New York, N. Y.
Swish—Cleaning compounds. Montgomery Chemical Co., Jenkintown, Pa.
Sylphon—Steam traps. Webster & Co., Warren, Camden, N. J.
Synchro-Flame—Burners. Synchronous Flame, Inc., Walworth, Wis.
Synchrogear—Changers. Zurn Industries, Inc., Erie, Pa.
Synchro-Lectric—Viscosimeters. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Synchron—Motors. Hansen Mfg. Co., Inc., Princeton, Ind.
Synchro-Scan—Indicators. Builders-Providence Div., B-I-F Industries, Inc., Providence, R. I.
Synchro Valves—Operators, valves. The Bristol Co., Waterbury, Conn.
Syncretizer—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Syncro—Gages, regulators, combustion control systems. Canton Stoker Corp., Canton, O.
Syncrogear—Drives, gear-motors, speed reducers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Syncro-Spede—Motors. Allis Co., Louis, Milwaukee, Wis.
Syndolag—Refractories and refractory cement. Basic Inc., Cleveland, O.
Synite—Protective coatings for metals. Arco Co., The, Cleveland, O.
Syphonaire—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.

T—Torches. Lincoln Electric Co., The, Cleveland, O.
TBTO—Water treatment. Metal & Thermit Corp., Rahway, N. J.
TMC—Dehydrators, refrigerant receivers. Tube Manifold Corp., North Tonawanda, N. Y.
T. T.—Smoke guns. Hill & Co., E. Vernon, Lake Geneva, Wis.
"TW"—Unit coolers. McQuay, Inc., Minneapolis, Minn.
TXT Valves—Valves. Texsteam Corp., Houston, Tex.
Tal-Bender—Benders. Hein-Werner Corp., Waukesha, Wis.
Tall Boy—Heaters. Lennox Industries, Inc., Marshalltown, Ia.
Tamax—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati, O.
Tampin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Tamul—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati, O.
Tanastic—Belting. Rhoads & Sons, J. E. Wilmington, Del.
Tanco—Insulation, duct, sound deadening. Thompson and Co., Oakmount, Pa.
Tankcaire—Dehumidifiers. Cargocaire Engineering Corp., New York, N. Y.
Tank-O-Meter—Gages, indicators. Uehling Instrument Co., Paterson, N. J.
Tanktrol—Regulators, switches, sprinkler system controls. Automatic Control Co., St Paul, Minn.
Tannate—Packing. Rhoads & Sons, J. E., Wilmington, Del.
Tannate-Rockwood—Belt drives. Rhoads & Sons, J. E., Wilmington, Del.
Tantalum—Protective coatings for metals. Haynes Stellite Co., Div. of Union Carbide Corp., New York, N. Y.
Tantalum—Capacitors. P. R. Mallory & Co., Inc., Indianapolis, Ind.
Tapebinder—Industrial tape. Gerrard & Co., A. J. Melrose Park, Ill.
Taper-Lock—Couplings, V-belt drives, pulleys and sheaves. Dodge Mfg. Corp., Mishawaka, Ind.
Tarblok—Refractories and refractory cement. Basic Inc., Cleveland, O.
Tasgon—Solvent. Cabot, Inc., Samuel, Boston, Mass.
Tasil—Furnace cement, refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati, O.
Tayco-40—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati.
Taycor—Refractories and refractory cement, furnace cement. Taylor Sons Co., The Charles, Cincinnati, O.
Teel—Pumps, circulators. Dayton Electric Mfg. Co., Chicago, Ill.
Teflon—Gaskets, plastic tubing. Chicago Gasket Co., Chicago, Ill.
Teflon—Pipe joints, packing. United States Gasket Co., Camden, N. J.
Teflon—Plastics, powder and resins. duPont deNemours & Co., Inc., E. I., Polychemicals Dept. Wilmington, Del.
Teflon-ize—Protective coatings. Chicago Gasket Co., Chicago, Ill.
Teksag—Boiler cleaning compounds. Agnew & Tomlinson, Long Island City, N. Y.
Tektolog—Recorders. Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tektor—Switches, alarms. Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tel-A-Pipe—Identification markers for piping. Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.
Telecator—Gages, recorders and recorder-controllers. Automatic Control Co., St. Paul.
Telecode—Relays. Benjamin Electric Mfg. Co., Des Plaines, Ill.
Telefier—Flame failure controls, combustion control systems. Protection Controls, Inc., Skokie, Ill.
Telescan—Recorders, transmitters, recorder-controllers. Automatic Control Co., St. Paul, Minn.
Teletrol—Indicator-controllers, recorder-controllers, recorders, transmitters. Automatic Control Co., St. Paul, Minn.
Teletrol—Controllers and starters. Airgard Mfg. Co., Chicago, Ill.

Tellevel—Switches. Stephens-Adamson Mfg. Co., Aurora, Ill.
Telltale—Valves. Watkins Co., J. E., Maywood, Ill.
Telstor—Gages, alarms. Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Teltru—Anemometers, gages, indicators. Hill & Co., E. Vernon, Lake Geneva, Wis.
Temflex—Plastic tubing. Irvington Div., Minnesota Mining & Mfg. Co., Irvington, N. J.
Temp-A-Rator—Valves. Beacon Brass Co., Waltham, Mass.
Tempchek—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Temp-Con-Trol—Valves. Raymanco Mfg. Co., Owatonna, Mich.
Temp-Guard—Motor controllers and starters, thermostats. Franklin Dales Co., Akron, O.
Tem-Plate—Temperature measuring instruments. Pyrodyne. Inc., Los Angeles, Calif.
Temp-lo—Insulation. Lockport Mills, Inc., Lockport, N. Y.
Tempmaster—Thermostats. Crown Controls Co., Inc., New Bremen, O.
Tempoint—Thermometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Tempotherm—Thermostats. General Controls Co., Glendale, Calif.
Temp-R-izer—Burners. Laharco Industries, Minneapolis, Minn.
Temproof—Bases and pads. Lord Mfg. Co., Erie, Pa.
Tempscribe—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Tenite—Plastics. Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn.
Tenite Acetate—Plastics, powders and resins. Eastman Chemical Products, Inc., Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Tenite Butyrate—Plastics, powders and resins. Eastman Chemical Products, Inc., Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Tenite Polyethylene—Plastics, powders and resins. Eastman Chemical Products. Inc. Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Tenite Polypropylene—Plastics, powders and resins. Eastman Chemical Products, Inc., Subsid., Eastman Kodak Co., Kingsport, Tenn.
Tenite Propionate—Plastics, powders and resins. Eastman Chemical Products, Inc., Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Tens-A-Matic—Motor bases. Industrial Marketers, Ferndale, Mich.
Tensilend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
Tensulate—Insulation. Tennessee Products and Chemical Corp., Nashville, Tenn.
Tergitol—Water treatment. Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N Y.
Termin-o-Seal—Seals. Parker Seal Co., Culver City, Calif.
Testite—Fittings. General Fittings Co., East Greenwich, R. I.
Texalon—Plastic belting. Rhoads & Sons, J. E., Wilmington, Del.
Texan—Heaters. Hotstream Heater Co., Cleveland, O.
Textolite—Plastic sheets, plastic tubing. General Electric Co., Laminated Products Dept., Coshocton, O.
T-Flo—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Thawzone—Dehydrant and acid neutralizer. Highside Chemicals, Inc., Clifton, N. J.
Them-O-Fin—Fin tube radiation. Heat Transfer Products, Inc., Perkasie, Pa.
Therma-Cal—Nameplates. North Shore Nameplate Inc., Bayside, N. Y.
Thermaflex—Connectors, tubing, ducts and duct fittings, hose. Flexible Tubing Corp., Guilford, Conn
Therma-Koil—Tubing. Radiant Heat and Cooling Co., Santa Clara, Calif.
Thermalbridge—Thermometers. Thompson Research & Mfg. Co., Davenport, Fla.
Thermal Electric—Systems. Fluid Systems, Inc., New Haven, Conn.
Thermalink—Heaters, preheaters. Electro-Therm, Inc., Silver Spring, Md.
Thermalite—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Thermalite—High temperature paint. Tropical Paint Co., Cleveland, O.
Thermaload—Motor controllers and starters. Monitor Controller, Rockland, Mass.
Therma-Mark—Nameplates. North Shore Nameplate, Inc., Bayside, N. Y.
Thermasil—Insulation. Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Thermatrol—Compressors, cooling towers, valves. Schnacke, Inc., Evansville, Ind.
Thermatube—Pre-insulated pipe. Flexible Tubing Corp., Guilford, Conn.
Thermek—Tubing, aftercoolers, chillers, coils, condensers, coolers, exchangers, preheaters, surface cooling. Heatron, Inc., York, Pa.
Thermidaire—Furnaces, heaters, heating and ventilating units, air conditioning units. Campbell Co., E. K., Kansas City, Mo.
Thermo—Expansion valves. Alco Valve Co., St. Louis, Mo.
Thermobank—Systems, compressors. Kramer Trenton Co., Trenton, N. J.
Thermobank-Compressors—Hot gas defrosting systems for refrigeration. Kramer Trenton Co., Trenton, N. J.
Thermobestos—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Thermo Clix—Switches. Nason Co., Clarkston, Mich.
Thermodulor—Control systems. Carvell Heat Equipment Co., Los Angeles, Calif.
Thermoflex—Strainers, radiator orifices, traps, valves. Cashin Co., W. D., Boston, Mass.
Thermoflow—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Thermo Grip—Torches. Ideal Industries, Inc., Sycamore, Ill.
Thermoguide—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Thermo - Humidigraph—Recorder - controllers. Bristol Co., The, Waterbury, Conn.
Thermoil-Granodine—Protective coatings. Amchem Products, Inc., Ambler, Pa.
Thermojet—Systems. International Boiler Works Co., The, East Stroudsburg, Pa.
Thermo-Kleen—Treatment. Acme Chemical Co., Milwaukee. Wis.
Thermolevel—Liquid level switches. Watkins Co., J. E., Maywood, Ill.
Thermolite—Plastics, powders and resins. Metal & Thermit Corp., Rahway, N. J.
Thermolier—Unit heaters. Grinnell Co., Inc., Providence, R. I.
Therm-O-Mite—Valves. Beacon Brass Co., Waltham, Mass.
Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.
Thermoramic—Thermostats. General Controls Co., Glendale, Calif. and Skokie, Ill.
Thermoseal—Windows. Russell Co., F. C., The, Columbiana, O.
Thermoswitch—Thermostats, regulators. Fenwal, Inc., Ashland, Mass.
Therm-o-tile—Conduit. Porter & Co., Inc., H. W., Newark, N. J.
ThermoTrode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Thermotrol—Valves. Sterling, Inc., Milwaukee, Wis.
Therm-O-Tron—Electric pipe thawers. Trindl Products, Ltd., Chicago, Ill.
Thermovent—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Thermox—Soot destroyers. Acme Chemical Co., Milwaukee, Wis.
Thermwire—Cables. Wiegand Co., Edwin L., Pittsburgh, Pa.
Thermxchanger—Condensers, converters, coolers, heaters, exchangers. Cooley Co., E. C., San Francisco, Calif.
Thick Coat—Protective coatings. Pennsalt Chemicals Corp., Philadelphia, Pa.
Thick or thin—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.
Thinline—Air conditioning units. General Electric Co., Major Appliance Div., Air Conditioning Dept., Louisville, Ky.
Thin Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Thin Tube—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Thor—Belting. Goodyear Tire & Rubber Co., Akron, O.
Thorobred cog-belt—V belts and v-belt drives Dayton Rubber Co., Dayton, O.
Thoro-Mix—Burners. Power-Flame Div., Inc., Grandview, Mo.
Thread-Tite—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Thred-O-Matic "22" & "44"—Machines, pipe cutting. Collins Machinery Corp., Los Angeles, Calif.
Thredolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
3C—Motor controls. Clark Controller Co., Cleveland, O.
360—Pipe repair clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
3M—Cements and compounds, insulation, plastic pipe. Minnesota Mining & Mfg. Co., St. Paul, Minn.
3 Way Weather-Flo—Thermostats. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Thrifti-Tower—Cooling towers. Marlo Coil Co., St. Louis, Mo.
Thrift-Line—Plastic pipe. Skyline Industries Sales, Inc., Titusville, Pa.
Thriftmaster—Convection radiation. General Heating Products Co., Philadelphia, Pa.
Thriftmaster—Water softeners. Modern Div., Water Equipment Co., Freeport, Ill.
33-Series—Cooling towers. Havens Cooling Tower, Div. of Havens Structural Steel Co., Kansas City, Mo.
Throway—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Thunder-Twist—Drills. New England Carbide Tool Co., Inc., Medford, Mass.
Thur-Ma-Lox—Coatings. Dampney Co., Boston, Mass.
TI-CO—Galvanized sheet steel. Inland Steel Co., Chicago, Ill.
TI-CO—Galvanized sheet steel. Inland Steel Products Co., Milwaukee, Wis.
Ticotherm—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Tiger—Packing. Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Cambridge, Mass.
Tillotson—Steam traps. Henry Owens & Co., Inc., Cranston, R. I.
Tilt Trap—Steam traps. Nason Co., Clarkston, Mich.
Time-O-Stat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tin-Ezy—Coatings, solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Tinol—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Tiny—Traps. Nason Co., Clarkston, Mich.
Titan—Traps. Nason Co., Clarkston, Mich
Titan—Boilers. Titusville Iron Wks. Co., The, Titusville, Pa.
Tite Kote—Sheets. Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Tite Seal—Cement and compounds. Radiator Specialty Co., Charlotte, N. C.
Toastmaster—Heaters. McGraw-Edison Co., Clark Div. & Tropic-Aire Div., Chicago, Ill.
Tom Thumb Pipe Master—Pipe machines Oster Mfg. Co., Wickliffe, O.
Tonrac—Compressors. American-Standard Industrial Div., Detroit, Mich.
Tool-Arc—Electrodes. Alloys Rods Co., York, Pa.
Toolweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Torchweld—Regulators, torches, welding and cutting apparatus. National Cylinder Gas Div. of Chemetron Corp., Chicago, Ill.
Tork Master—Switches. Tork Time Controls, Inc., Mt. Vernon, N. Y.
Tork-Master—Operators. General Controls Co., Glendale, Calif.
Tork Weather Control—Switches. Tork Time Controls, Inc., Mt. Vernon, N. Y.
Torpedo—Dehydrators, filters, strainers. Imperial Brass Mfg. Co., Chicago, Ill.
Torq-Stop—Wrenches. Richmont, Inc., Monrovia, Calif.
Torque-Arm—Reducers, drives. Dodge Mfg. Corp., Mishawaka, Ind.
T.O. Silencer—Sound absorbers. Hansson, Inc., Elof, Acoustical Div., New York, N. Y.
Totalume—Paint. Wilbur & Williams Co., Norwood, Mass.
Totrust—Protective coatings, enamels and lacquers. Wilbur & Williams Co., Norwood, Mass.
Trace—Refrigerant leak detectors. Highside Chemicals, Inc., Clifton, N. J.
Tramrail—Conveyors. Cleveland Crane & Eng. Co., Wickliffe, O
Transaire—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
Transaire—Transmitters. Taylor Instrument Companies. Rochester, N. Y.
Transcope—Regulators. Taylor Instrument Companies, Rochester, N. Y.
Transet—Regulators. Taylor Instrument Companies, Rochester, N. Y.
Transflex—Plastic tubing. Irvington Div., Minnesota Mining and Mfg. Co., Irvington, N. J.
Transhield—Pipe wrap. Johns-Manville, New York, N. Y.
Transite—Pipes, ducts and duct fittings sheets and board, underground piping conduits. Johns-Manville, New York, N. Y.
Trans-Pac—V belt drives. Indus Corp., Indianapolis, Ind.
Transparent—Analyzers, gages, kits, meters, switches, testers, tubes, manometers. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Trantex—Pipe wrap. Johns-Manville, New York, N. Y.
Trap-Dri—Dehydrators. A-R. Controls Div., Controls Co. of America, Milwaukee, Wis.
Treet-O-Control—Steam system and water treatment, pumps. B-I-F Industries, Proportioneers Div., Providence, R. I.
Treet-O-Unit—Feeders, pumps, water treatment. B-I-F Industries, Proportioneers Div., Providence, R. I.
Trenchliners—Trenching machines. Parsons Co., Div of Koehring Co., Newton, Ia.
Trentweld—Tubing, pipe. Crucible Steel Co. of America, Pittsburgh, Pa.
Triad—Stocks and dies. Nye Tool Co., Chicago, Ill.
Tribune—Hose. Continental Rubber Wks., Erie, Pa.
Tri-Clad—Motors. General Electric Co., Apparatus Dept., Schenectady, N. Y.
Trident—Meters. Neptune Meter Co., New York, N Y.
Tri-Flex—Registers, grilles. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Tri-Flux—Motors. Redmond Co., Inc., Owosso, Mich.
Tri-Flux—Solder. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Tri-Guard—Protective coatings. Foster Co., Benjamin, Philadelphia, Pa.

Tri-Lug—Unions. Rockwood Sprinkler Co., Worcester, Mass.
Trimline—Radiation. Vulcan Radiator Co., Hartford, Conn.
Trimo—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Trimo—Pipe wrenches. Trimount Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimo Alloy—Pipe wrenches. Trimount Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimo Spiral Grip—Pipe wrenches. Trimount Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trio-Stat—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Triple-A—Enamels and lacquers, paint, protective coatings. Quigley Co., Inc., New York.
Triple-lok—Fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Triple-Seal—Fittings. Imperial Brass Mfg. Co., Chicago, Ill.
Triplex—Stocks and dies. Nye Tool Co., Chicago, Ill.
Tripl-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Tri-Rotor—Pumps. Yale & Towne Mfg. Co., White Plains, N. Y.
Tri-Sul-Ite—Pipe and tubing insulation. Ziegler & Co., G. S., Great Neck, N. Y.
Tri-Weld—Pipe fittings. Ladish Co., Tri-Clover Div., Kenosha, Wis.
Trojan—Boilers. Burnham Corp., Irvington, N. Y.
Trojan—Boilers. Titusville Iron Wks. Co., The, Titusville, Pa.
Trojan—Stokers. Auburn Burner Co., Auburn, Ind.
Trombone—Finned surface. Nesbitt, Inc., John J., Philadelphia, Pa.
Trona—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Tropelite—Coatings. Tropical Paint Co., Cleveland, O.
Tropic-Aire—Heaters. Coolerator Div., McGraw-Edison Co., Albion, Mich.
Tropic-Aire—Air conditioning units. McGraw-Edison Co., Clark Div. & Tropic-Aire Div., Chicago.
Tropic-Breeze—Air conditioning units, burners. Dalzen Mfg. Co., St. Clair, Mich.
Tropilux—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Tru-Air—Air conditioning units, surface, systems, condensers, cooling towers, eliminators, exchangers, heaters. Blazer & Son, M., Passaic, N. J.
True Heat—Radiation. Pacific Steel Boiler Div., National-U.S. Radiator Corp., Johnstown, Pa.
True-Pitch Level—Tools. Dreier Bros., Inc., Chicago, Ill.
Truespot—Testers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Truflex—Bi-metals. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Truflex—Drives, v-belts. Gates Rubber Co., The, Denver, Colo.
Truflex—Thermostatic bi-metals. Texas Instruments Inc., Metals & Controls Div., Attleboro, Mass.
Tru-Grip—Pulleys and sheaves. Gates Rubber Co., Denver, Colo.
Truk-Cel—Unit coolers. Dole Refrigerating Co., Chicago, Ill.
Truliradiant—Burners. Gold Top Heating, Inc., San Gabriel, Calif.
Truliradiant—Gas burners. Sullivan Valve & Engineering Co., Butte, Mont.
Tru-Perimeter—Heating systems. Webster & Co., Warren, Camden, N. J.
Tru-Set—Fasteners. Ramset Fastening System, Winchester-Western Div., Olin-Mathieson Chemical Corp., New Haven, Conn.
Try-Me—Regulators, filters, strainers, valves. Tryco Products, Inc., Westfield, Mass.
Tube-alloy—Electrodes. McKay Co., Pittsburgh, Pa.
Tubecote—Protective coatings. Wilhelm Co., A., Reading, Pa.
Tuff-Bond—Adhesives, cement, insulation. Moore Inc., Goodloe E., Danville, Ill.
Tufflex—Bases and pads, insulation. Wood Conversion Co., St. Paul, Minn.
Tuf-flex—Gage and sight glasses. Libbey-Owens-Ford Glass Co., Toledo, O.
Tuff-Weld—Fasteners, hangers. Moore Inc., Goodloe E., Danville, Ill.
Tuf-On—Protective coatings. Brooklyn Paint & Varnish Co., Inc., Brooklyn, N. Y.
Tulox—Tubing. Extruded Plastics, Inc., Norwalk, Conn.
Tumblin—Bolts. Star Expansion Industries Corp., Mountainville, N. Y.
Turbaire—Refrigerating condensers. Acme Industries, Inc., Jackson, Mich.
Turbinair—Motors. Joy Mfg. Co., Pittsburgh, Pa.
Turbo—Air washers. Bayley Blower Co., Milwaukee, Wis.
Turbo-Aire—Overfire air jets, smoke alarms. Canton Stoker Corp., Canton, O.
Turbo-Fire—Burners. Gordon & Piatt, Inc., Winfield, Ks.
Turbo Heat—Burners. Barber Mfg. Co., Cleveland, O.
Turbomaster—Air compressors. York Corp., Subsid. of Borg-Warner Corp., York, Pa.
Turbo-Ring—Burners. Gordon & Piatt, Inc., Winfield, Kans.
Turbo Vane—Fans and blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Turbulaire—Dryers. Western Precipitation Corp., Los Angeles, Calif.
Turcoat—Coatings. Turco Products, Inc., Los Angeles, Calif.
Twindow—Heating insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twin G-Fin—Preheaters. Griscom-Russell Co., Massillon, O.
Twin Seal—Check valves, gage testers. Mansfield & Green, Inc., Cleveland, O.
Twinsulation—Building insulation. National Gypsum Co., Buffalo, N. Y.
Two-Tank-1—Oil burner filters. Barclay, Inc., Robert, Chicago, Ill.
Tygon—Protective coatings, gaskets, plastic tubing. United States Stoneware Co., New York, N. Y.
Tygon—Protective coatings, plastic tubing. United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Tylox—Pipe couplings. United States Stoneware Co., New York, N. Y.
Tyte-Unyte—Cement and compounds, sealing compounds. Whitlam Mfg. Co., J. C., Wadsworth, O.

U-Brand—Fittings. Union Malleable Mfg. Co., Ashland, O.
USG—Louvers and shutters. United States Gypsum Co., Chicago, Ill.
U. S. S.—Angles, sheets. United States Steel Co., Pittsburgh, Pa.
USS—Pipe, tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
U-S-S—Sheets, angles. Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
U. S.—Valves. Powell Co., Wm., The, Cincinnati, O.
U. S. Royal—Packing. United States Rubber Co., New York, N. Y.
UXLD—Regulators. Duro-Dyne Corp., Farmingdale, Long Island, N. Y.
Ucilon—Protective coatings, enamels and lacquers, tank linings, high temperature paint. Metal & Thermit Corp., Rahway, N. J.
Ucon—Lubricants, oils, fluorocarbon refrigerants. Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N. Y.
U-Cote—Pipe fittings. Union Malleable Mfg. Co., Ashland, O.
Ultra-Aire—Filters. Mine Safety Appliances Co., Pittsburgh, Pa.
Ultra-filtration—Air filters. Wheelabrator Corp., Mishawaka, Ind.
Ultrafine—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultraflo—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Ultra-Line—Plastic pipe. Skyline industries Sales, Inc., Titusville, Pa.
Ultralite—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultra-Viscoson—Viscosimeters. Bendix Aviation Corp., Cincinnati Div., Cincinnati, O.
Una-Dyn—Dehumidifiers, industrial dryers, indicator-controllers, indicators, recorder-controllers, recorders. Universal Dynamics Corp., Arlington, Va.
Unarco—Insulation, gaskets, packing, insulating cement, condensers, heaters, radiation, surface cooling & heating, air conditioning units. Union Asbestos & Rubber Co., Chicago, Ill.
Unbrako—Parts for heating & air conditioning equipment, repair plugs. Standard Pressed Steel Co., Jenkintown, Pa.
Underflow—Cooling Towers. Marley Co., The, Kansas City, Mo.
Uni-Built—Pumps. Bell & Gossett Co., Morton Grove, Ill.
Uni-cast—Motors. Redmond Co., Inc., Owosso, Mich.
Unichiller—Compressors. Vilter Mfg. Co., The, Milwaukee, Wis.
Unichrome—Protective coatings, enamels and lacquers, tank linings. Metal & Thermit Corp., Rahway, N. J.
Uniclosed—Electric motors. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Unicoils—Finned surfaces. Clarage Fan Co., Kalamazoo, Mich.
Unicon—Refrigerating condensers. Kramer Trenton Co., Trenton, N. J.
Unicon-Compressor—Refrigerating compressors. Kramer Trenton Co., Trenton, N. J.
Unifil—Fittings and bushings. Scully Signal Co., Melrose, Mass.
UNIFIL Systems—Connectors. Scully Signal Co., Melrose, Mass.
Uniflare—Fittings. Scovill Mfg. Co., Waterbury, Conn.
Uni-Flo Air Valves—Valves. Barber-Colman Co., Rockford, Ill.
Uni-flo—Diffusers, grilles, mixing units, regulators, registers. Barber-Colman Co., Rockford, Ill.
Uniflow—Oil burners. Ace Engineering Co., Chicago, Ill.
Unimatic—Water softeners. Modern Water Equipment Co., Freeport, Ill.
UniMatic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Unimount—Pumps. March Mfg. Co., Inc., Skokie, Ill.
Union—Valves. Powell Co., Wm., The, Cincinnati, O.
Union—Incinerators. Syrall Mfg. Co., Syracuse, N. Y.
Unipack—Welding fume exhausters, centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Unipak—Electrical capacitors. Sprague Electric Co., North Adams, Mass.
Unipump—Pumps. Weinman Pump Mfg. Co., Columbus, O.
Uni-Resonator—Sound absorbers. Hansson, Inc., Elof, Acoustical Div., New York, N. Y.
Uniseal—Electric motors. Franklin Electric Co., Inc., Bluffton, Ind.
Unishears—Electric shears. Stanley Electric Tools Div., The Stanley Works, New Britain, Conn.
Uni-Silencer—Absorbers. Elof Hansson, Inc., Acoustical Div., New York, N. Y.
Unisorb—Bases and pads. Felters Company, The, Boston, Mass.
Unistage—Aftercoolers. Schramm, Inc., West Chester, Pa.
UniStoker—Stokers. Detroit Stoker Co., Monroe, Mich.
Uni-Strainer—Strainers. Perfecting Service Co., Charlotte, N. C.
Unitair—Air compressors. Joy Mfg. Co., Pittsburgh, Pa.
Unitaire—Air conditioning units. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Unitem—Heaters. Bell & Gossett Co., Morton Grove, Ill.
Unitherm—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Unit Fin—Radiation. Vapor Heating Corp., Chicago, Ill.
Unitite—Valves. Hanna Engineering Wks., Chicago, Ill.
Unit-Line—Pumps. Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co., Pasadena, Calif.
UniTrane—Air conditioning units and coolers. Trane Co., The, La Crosse, Wis.
Uni-Trap—Steam traps. Perfecting Service Co., Charlotte, N. C.
Unitrol—Boards. Cutler-Hammer, Inc., Milwaukee, Wis.
Universal—Benders. Hossfeld Mfg. Co., Winona, Minn.
Universal—Cast iron pipe. Central Foundry Co., New York, N. Y.
Universal—Centrifugal pumps. Valve & Gossett Co., Morton Grove, Ill.
Universal—Packing. Johns-Manville, New York, N. Y.
Universal—Pumps. Wright Mfg. Co., Phoenix, Ariz.
Universal—Regulators. Dockson Corp., Detroit, Mich.
Universal—Speed reducers and increasers. Link-Belt Co., Chicago, Ill.
Universal CP—Drills. Chicago Pneumatic Tool Co., New York, N. Y.
Universal Unaflow—Engines. Skinner Engine Co., Erie, Pa.
Univers-L-Mount—Pumps. March Mfg. Co., Inc., Skokie, Ill.
Uni-Wash—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.
Uno Turbine—Ventilators. Uno Ventilator Co., Malden, Mass.
Uno Venturette—Ventilators. Uno Ventilator Co., Malden, Mass.
Urefoam—Insulating cement, pipe insulation. Atlas Mineral Products Co., Mertztown, Pa.
Urethane—Protective coatings. Gates Engineering Co., Wilmington, Del.
Urethane—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
UsAIRco—Air conditioning equipment, exhauster units, blowers, condensers, surfaces, heaters. United States Air Conditioning Corp., Delaware, O.
Uscolite—Plastic pipe, fittings, plastic valves. United States Rubber Co., New York, N.Y.
Util-i-Torch—Torches. Turner Brass Works, The, Sycamore, Ill.
Utilitube—Aluminum tubing. Aluminum Co. of America, Pittsburgh, Pa.
Utility—Blowers. American-Standard Industrial Div., Detroit, Mich.
Utility—Roof ventilators. Arex Co., Chicago.
Utility—Heaters. Wing Mfg. Co., L. J., New York, N. Y.

VB Reflecto-Batt—Insulation. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
VL-5—Lubricants. Jet-Lube, Inc., Burbank, Calif.

V Line—Tools. Millers Falls Co., Greenfield, Mass.
VP-Ex—Ventilators. New York Blower Co., Chicago, Ill.
VRC—Air Conditioning units. Drayer-Hanson Div. of National U. S. Radiator Corp., Los Angeles, Calif.
V*S—Changers. Reliance Electric & Engineering Co., Cleveland, O.
Vac-Master—Vacuum cleaners. Cincinnati Fan and Ventilating Co., Cincinnati, O.
Vacu-Flo—Fittings. H-P Products, Inc., Louisville, O.
Vacsul—Oil. Mobil Oil Co., Inc., New York, N. Y.
Vacumatic—Ejectors, pumps. Whittington Pump & Engineering Corp., Indianapolis.
Vacuum Cold Plate—Coils and panels. Dole Refrigerating Co., Chicago, Ill.
Vacuum Filter—Water filters. B-I-F Industries, Proportioneers Div., Providence, R. I.
Vacuumstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Valcalox—Dampers, regulators. Young Regulator Co., Cleveland, O.
Valvactor—Valve operators. Foxboro Co., Foxboro, Mass.
Valvatrol—Valves, diaphragm. Squires Co., C. E., The, Cleveland, O.
Valvent—Roof ventilators. Swartwout Co., Cleveland, O.
Valvrator—Valves. Fischer & Porter Co., Hatboro, Pa.
Vanco—Louvers and shutters. Van Noorden Co., E., Boston, Mass.
Vanco Exhaustmaster—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Firevent—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco "QR"—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Roofline—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Simplex—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Sleek-Line—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Superflo—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Upblast—Ventilators. Van Noorden Co., E., Boston, Mass.
Van Cor—Ducts and duct fittings, hose to pipe fittings, plastic pipe fittings, hoods, pipe joints, plastic unions, plastic pipe, plastic sheets, valves, pipe nipples, pipe flanges, tank linings, tanks. Colonial Plastics Mfg. Co., Industrial Div., Cleveland, O.
Vapco—Compounds. Garman Co., Inc., The, St. Louis, Mo.
Vapco-Phos Nuggets—Water treatment. Garman Co., Inc., The, St. Louis, Mo.
Vapco Slime-X—Water treatment. Garman Co., Inc., The, St. Louis, Mo.
Vape-Sorber—Filters. Selas Corp. of America, Dresher, Pa.
Vapomatic—Hot gas defrosting systems. Recold Corp., Los Angeles, Calif.
Vaporene—Compound and water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Vapor-Clarkson—Heating and process boilers. Vapor Heating Corp., Chicago, Ill.
Vaporstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Vapowall—Insulation, vapor barriers. MMM, Inc., Houston, Tex.
Vari-Basic—Fan housings. Torrington Mfg. Co., The, Torrington, Conn.
Varidrive—Speed changers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Vari-Speed Drives—Speed changers. Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Vari-Temp—Air conditioning units. Dunham-Bush, Inc., West Hartford, Conn.
Vari-Vac—Heating systems, control systems. Dunham-Bush, Inc., West Hartford, Conn.
Vaultmaster—Air conditioning units. Haertel Co., Walter, Minneapolis, Minn.
Vcon—Oil. Union Carbide Chemicals Co., Div. of Union Carbide Corp., New York, N Y
Veco—Analyzers, combustion testing kits, recorders, thermometers. Victory Engineering Corp., Union, N. J.
Veeco—Leak detectors. Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Veegroo—Valves. General-American Valve Co., Corona Del Mar, Calif.
Vee Jet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Veelos—V-belts. Manheim Mfg. & Belting Co., Manheim, Pa.
Velometer—Air velocity meters. Illinois Testing Laboratories, Inc., Chicago.
Velvetrol—Valves. J. D. Gould Co., Indianapolis, Ind.
Ventafil—Fittings and bushings. Scully Signal Co., Melrose, Mass.
VENTALARM—Alarms, gages, fittings and bushings. Scully Signal Co., Melrose, Mass.
Ventbestus—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventfab—Flexible duct connections. Ventfabrics, Inc., Chicago, Ill.
Ventflo—Valves. Quality Specialty Co., Inc., Camden, N. J.
Ventglas—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventlok—Doors and panels, parts for heating and air conditioning equipment. Ventfabrics, Inc., Chicago, Ill.
Vento—Traps. Haines & Co., Wm. S., Div. Sellers Injector Corp., Philadelphia.
Vent-Rite—Radiator valves. Anderson Products, Inc., Newtonville, Mass.
Vent Set—Wall fan ventilators. DeBothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Ventura—Fans. American-Standard Industrial Div., Detroit, Mich.
Venturafin—Unit heaters. American-Standard Industrial Div., Detroit, Mich.
Venturi—Fan housings. Commercial Shearing & Stamping Co., Youngstown, O.
Venturi—Meters, nozzles. Builders-Providence Div., B-I-F Industries Inc., Providence, R. I.
Venturi-Flo—Refrigerant distributors. Alco Valve Co., St. Louis, Mo.
Venturi-Flo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Venturi One—Fittings. Taco Heaters, Inc., Cranston, R. I.
Venturi-Top—Caps, roof ventilators. Walker Mfg. & Sales Co., St. Joseph, Mo.
Vent-Vac—Heating systems. Anderson Products, Inc., Cambridge, Mass.
Vent-X-It—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Ventyvinyl—Connections. Ventfabrics, Inc., Chicago, Ill.
Verco—Insulating cement. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Verithin-Microrold—Steel sheets. Washington Steel Corp., Washington, Pa.
Vermiculite—Insulation. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Vernier-Set—Time switches. Automatic Timing & Controls, Inc., King of Prussia, Pa.
Vertex—Paint, sealing compounds. Whitlam Mfg. Co., J. C., Wadsworth, O.
Vertiflow—Unit heaters. Young Radiator Co., Racine, Wis.
V-Flat—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vibracork—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Vibraducer—Absorbers. Atlantic Metal Hose Co., Inc., New York, N. Y.
Vibra Free—Absorbers. Williamson Co., The, Cincinnati, O
Vibra grate—Stokers. American Engineering Co., Philadelphia, Pa.
Vibra-Joint—Pipe joints. Saussé & Co., M. W., Los Angeles, Calif
Vibra-Mount—Vibration bases. American Felt Co., Glenville, Conn.
Vibrashock—Bases and pads. Robinson Aviation, Inc., Teterboro, N. J.
Vibra-sorber—Vibration absorbers. Flexonics Corp., Maywood, Ill.
Vibrastop—Duct connections. Grant Wilson, Inc., Chicago, Ill
Vibratamer—Vibration absorbers. Allied Metal Hose Co., Long Island City, N. Y.
Vibrex—Bases and pads, hangers and supports. Saussé & Co., M. W., Los Angeles, Calif.
VibrJoint—Absorbers. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Vibrograph—Vibration detectors. Korfund Co., Inc., Long Island City, N. Y.
Vibro-Hangers—Pipe hangers and supports, absorbers. Korfund Co., Inc., Long Island City, N. Y.
Vibro-Isolators—Bases and pads, noise elimination for cooling towers, vibration absorbers. Korfund Co., Inc., Long Island City, N. Y.
Vibrometer—Vibration detectors. Korfund Co., Inc., Long Island City, N. Y.
Vichrome—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Victor—Water heaters. Cleveland Heater Co., Inc., Cleveland, O
Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Viking—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
V-in-Tah—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
Vim—Belting, gaskets, leather packing. Houghton & Co., E. F., Philadelphia, Pa.
Vim Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Vinsynite—Coatings. Thompson and Co., Oakmont, Pa.
Vinyl—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Vinylgrip—Adhesives for pipe covering. Adhesive Products Corp., New York, N. Y.
Visaflame—Controls. Mercoid Corp., The, Chicago, Ill.
Viscograph—Viscosimeters. Brabender Corp., Rochelle Park, N. J.
Viscomparator—Viscosimeters. Bendix Aviation Corp., Cincinnati Div., Cincinnati, O.
Viscorator—Viscosimeters. Fischer & Porter Co., Hatboro, Pa.
Visi-Flare—Flaring tools for tubing. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Viso Flo—Sight glasses. OPW-Jordan, Cincinnati, O.
Visoleak—Leak detectors. Allin Mfg. Co., Chicago, Ill.
Vistex—Gaskets, rubber and synthetic packing. American Felt Co., Glenville, Conn.
Vitalic—Hose. Continental Rubber Wks., Erie, Pa.
Vitalloy—Wrenches. Billings & Spencer Co., Hartford, Conn
Vitreon—Pipe. Robinson Clay Products Co., Inc., The, Akron, O.
Vitricel—Refractories. Carey Mfg. Co., Philip, The, Lockland, Cincinnati, O.
Vitrilan—Protective coatings for metals, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. Y.
Vitroliner—Pipe and fittings, stacks and chimneys. Condensation Engineering Corp., Chicago, Ill.
Vix-Syn—Rubber and synthetic packing. Houghton & Co., E. F., Philadelphia, Pa.
V-Meth-L—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Voladjuster—Dampers. Barber-Colman Co., Rockford, Ill.
Vol-O-Flo—Meters. National Instrument Laboratories, Inc., Washington, D. C.
Vol-Pac—Packing. Houghton & Co., E. F., Philadelphia, Pa.
Voltreet—Treatment. Acme Chemical Co., Milwaukee, Wis.
Vornado—Fans, air conditioning units. Sutton Corp., O. A., The, Wichita, Kans.
Vortex—Pumps. Lawrence Pump and Engine Co., Lawrence, Mass.
V-Series—Cooling towers. Havens Cooling Tower, Div. of Havens Structural Steel Co., Kansas City, Mo.
V-to-V—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vulcalock—Linings, tank; adhesives. Goodrich Industrial Products Co., B. F., Akron, O.
Vulcan—Stands, tongs, vises, wrenches. Williams & Co., J. H., Buffalo, N. Y.
Vulcan—Stokers. Canton Stoker Corp., Canton, O.
Vulcan Superior—Tongs, vises, wrenches. Williams & Co., J. H., Buffalo, N. Y.
Vulco—Pulleys. Gates Rubber Co., Denver, Colo.
Vulco Ropes—Belts, drives. Gates Rubber Co., Denver, Colo.
Vulcomount—Pulleys. Gates Rubber Co., Denver, Colo.
Vyflex—Tank linings. Kaykor Industries, Inc., Yardville, N. J.

W. & McD.—Strainers. Watson & McDaniel Co., Philadelphia, Pa.
WMT—Cooling towers. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
WS—Valves. Powell Co., Wm., The, Cincinnati, O.
W & T—Chlorinators, feeders, gages, indicators. **Wallace & Tiernan Inc., Belleville, N. J.**
W.T.E.—Boilers. Murray Iron Works, Co., Burlington, Ia.
WTP—Boilers. Titusville Iron Wks. Co., The, Titusville, Pa.
W & W—Pipe hangers. Western Wire Products Co., St. Louis, Mo.
Wadco—Oil. Whitlam Mfg. Co., J. C., Wadsworth, O.
Wagener—Pumps. Canton Stoker Corp., Canton, O.
Waikiki—Heaters. Vapor Heating Corp., Chicago, Ill.
Wakefield—Coils, fittings, pipe, pumps, tanks and valves. Lead Lined Iron Pipe Co., Wakefield, Mass.
Walco-Parmelee—Wrenches. Walworth Co., New York, N. Y.
Walltube—Radiator brackets or hangers. Arjac Products Inc., Rochester, N. Y.
Walseal—Fittings, valves. Walworth Co., New York, N. Y.
Walvector—Radiation. Webster & Co., Warren, Camden, N. J.
Warco—Fuel oil treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Warcolite—Enamels and lacquers. Warren Refining & Chemical Co., The, Cleveland.
Warnock—Wrenches. Lowell Wrench Co., Worcester, Mass.
Watch Dog—**Meters. Gamon Meter Div., Worthington Corp., Newark, N. J.**
Watchman—Water heaters. Vapor Heating Corp., Chicago, Ill.
Watco—Cooling towers, systems. Water Cooling Corp., New York, N. Y.
Water-Boy—Feeders, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Water-King—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.

Water Master—Filters. Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Water Shoot—Dust collectors. David-Ludwig Co., Detroit, Mich.
Water-Skipper—Protective coatings for metals. Easton R. S. Corp., Brooklyn, N. Y.
Wa-Trol—Regulators. Thermal Agency, Houston, Tex.
Wa-Tu-Bo—Coils, steam convertors, boilers, heat exchangers, water heaters, preheaters. Water Tube Boiler & Tank Co., Chicago, Ill.
Way Loctor—Doors and panels. Walsh-Hannon-Gladwin, Inc., Boston, Mass.
Wear-Arc—Electrodes. Alloy Rods Co., York, Pa.
Wear-Arc "Super WH"—Electrodes. Alloy Rods Co., York, Pa.
Wear-O-Matic—Electrodes. Alloy Rods Co., York, Pa.
Wearweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Weather—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Weather-Analoy—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Weather-Chron—Switches, control systems, regulators, thermostats. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Weather-Damper—Regulators. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Weather-Flo—Thermostats, control systems, heating systems, regulators. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Weathermaker—Unit air conditioners. Carrier Corp., Syracuse, N. Y.
Weather-Man—Regulators, thermostats, control systems. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Weathermaster—Air conditioning units. Carrier Corp., Syracuse, N. Y.
Weatherstat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Weather-Therm—Fan controls. Automatic Devices Div. of American Machine & Metals, Inc., Western Springs, Ill.
Weathertrol—Air conditioning units. Therm-Air Mfg. Co., Peekskill, N. Y.
Weatherwise—Air conditioning units. Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Webco-Ray—Boilers, heaters. Western Boiler Co., Los Angeles, Calif.
Webster Moderator—Thermostats, valves. Clark-Cooper Co., Inc., CC Pump Div., Palmyra, N. J.
Weco—Plugs, steel unions. Chiksan Co., Brea, Calif.
Wedge-Lock—Pipe, fittings. Robinson Clay Product Co., The, Akron, O.
Wedgeplug—Valves. Stockham Valves & Fittings, Birmingham, Ala.
Wedgemount—Vibration bases. Air-Loc Div., Clark, Cutler, McDermott Co., Franklin, Mass.
Weir—Stokers. Meyer Furnace Co., The, Peoria, Ill.
Weldaluminite—Welding compounds. Special Chemicals Corp., Ossining, N. Y.
Weldanpower—Welders. Lincoln Electric Co., The, Cleveland, O.
WeldELLS—Welding fittings. Taylor Forge & Pipe Works, Chicago, Ill.
Weld-Ends—Pipe couplings, fittings. Pipe Line Development Co., Cleveland, O.
Weldfast—Pipe joint cement and compounds. Fibercast Co., Sand Spring, Okla.
Weld-lok—Fittings. Parker Fittings & Hose Div. of Parker-Hannifin Corp., Cleveland, O.
Weldolets—Fittings. Bonney Forge & Tool Works, Allentown, Pa.
Weld-O-Vent—Welding fume exhausters. Engwald Corp., The, Inwood, Long Island, N. Y.
Weldreel—Welders, welding and cutting apparatus. United Specialties, Inc., El Dorado, Ark.
Wesco—Boilers. Wescott Snyder Mfg. Corp., Madison, N. J.
Wesco-Cool—Surface, finned, cooling; unitary air conditioners. Wescott Snyder Mfg. Corp., Madison, N. J.
Wescofin—Radiation, surface, finned, heating. Wescott Snyder Mfg. Corp., Madison, N. J.
Western—Fans, furnaces, heaters, unitary air conditioners, ventilators. Tuck-Aire Furnace Co., San Francisco, Calif.
Westernaire—Fans. Western Engineering & Mfg. Co., Los Angeles, Calif.
Western Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.
West-Flex—Hose. Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Wevelite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Whiffletree—Valves. Dahl Co., Inc., G. W., Bristol, R. I.
Whirlcone—Spray nozzles. Water Cooling Equipment Co., St. Louis, Mo.
Whirljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Whistler—Alarms. Applied Mechanics Co., Boston, Mass.
White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Whiting Rust Cutter—Penetrant solvent. Claronex Products, Inc., Brooklyn, N. Y.
Wigwam Thermcap—Vent flue caps. Boston Machine Works Co., Lynn, Mass.
Wilco—Bi-metals. Wilson Div., H. A., Engelhard Industries, Union, N. J.
Wilco—Pipe cutting machines. Oster Mfg. Co., Wickliffe, O.
Wimco—Tubing Cutters. Wilson Mfg. Co., Memphis, Tenn.
Wincinator—Incinerators, stacks and chimneys. Winnen Incinerator Co., Bedford, O.
Wind-A-Clamp—Hose clamps. Manufacturers Corp., Mansfield, O.
Windmaster—Fans. Acme Engineering & Mfg. Corp., Muskogee, Okla.
Windmaster—Propeller fans, ventilators. Consolidated General Products, Inc., Houston, Tex.
Wind-O-Cool—Fans. Belco Industries, Inc., St. Louis, Mo.
Wind-O-Line—Ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Wind-O-Vent—Window ventilator and filter units. Reed Unit-Fans, Inc., New Orleans.
Wingfoil—Exhausters, fans. Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Wingjet—Ventilators. Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc., Linden, N. J.
Winkler—Burners, boilers, heaters, stokers. Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Winter-Chaser—Air conditioning units, furnaces, heaters. Campbell Heating Co., Des Moines, Ia.
Witch—Bolts, clamps, hangers, inserts, protectors. Carpenter & Paterson, Inc., Cambridge, Mass.
Wolf-Linde—Condensers, compressors, fittings, flanges, strainers, valves. Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Wondaire—Heaters, burners, furnaces. Cox Mfg. Co., Ridgeville, Ind.
Wonder—Pipe benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
Wondercote Alkyd—Enamels and lacquers. Sonneborn Sons, Inc., L., Building Products Div., New York, N. Y.
Wurtzilite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.

X-L—Gaskets, packing. Excelsior Leather Washer Mfg. Co., Rockford, Ill.
XX—Sheet metal punches. Duro-Dyne Corp., Long Island, N. Y.
Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
Xyron—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

YC—Air conditioning units. Young Radiator Co., Racine, Wis.
Yager's—Solder. Benson Co., Inc., Alex R., New Hartford, N. Y.
Yarway Fine Screen—Strainers. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Gun-Pakt—Expansion pipe joints. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Hi-Lo—Alarms. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Hi-Lo-Graph—Recorders. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Impulse—Steam traps. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Involute—Spray nozzles. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Remote—Indicators. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Seatless—Valves. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Unit-Tandem—Valves. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Welbond—Valves. Yarnall-Waring Co., Philadelphia, Pa.
Yoloy—Pipe, sheet, tubing. Youngstown Sheet & Tube Co., Youngstown, O.

Zaflo—Enamels and lacquers. Glidden Co., Nubian Div., Chicago, Ill.
Zaponite—Enamels and lacquers. Glidden Co., Nubian Div., Chicago, Ill.
Zatex—Enamels and lacquers. Glidden Co., Nubian Div., Chicago, Ill.
Zebogene—Treatment. Berna Corp., Garwood, N. J.
Zephyrcon—Condensers. Larkin Coils, Inc., Atlanta, Ga.
Zero—Cement, refractories. Standard Fuel Engineering Co., Detroit, Mich.
Zer-O-Disc—Finned surface. Vilter Mfg. Co., The, Milwaukee, Wis.
Zerofrost—Systems. McQuay, Inc., Minneapolis, Minn.
Zerolite—Pipe insulation. Johns-Manville, New York, N. Y.
Zeropaks— Coolers. McQuay, Inc., Minneapolis, Minn.
Zig Zag—Heat exchangers. Stout & Sons, David, St. Louis, Mo.
Zinaloy—Zinc sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
ZINCGRIP—Sheets. Armco Steel Corp., Middletown, O.
Zincilate—Coatings. Industrial Metal Protectives, Inc., Dayton, O.
Zincoater—Coatings. Tropical Paint Co., Cleveland, O.
Zinc Soot—Soot destroyers. Tamms Industries Co., Chicago, Ill.
Zinkote—Protective coatings for metals. Amercoat Corp., South Gate, Calif.
Zip Dyeline Inspector—Piping leak detectors. Zaco Laboratories, Cleveland, O.
Zip-On—Plastic tubing. Devices, Inc., A Div. of Miracle Adhesives Corp., Bellmore, N. Y.
Zipper—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zip-Portable—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zip Speed Lacquer—Identification markers. Zaco Laboratories, Cleveland, O.
Zircon—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati, O.
Zone-A-Loop—Valves. White-Rodgers Co., St. Louis, Mo.
Zone-A-Matic—Boilers. Edwards Engineering Corp., Pompton Plains, N. J.
Zone-Pac—Heating systems. Barber-Colman Co., Rockford, Ill.
Zonetrol—Systems. Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.
Zytel—Plastics, powder and resins. duPont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS

PART 4 — ALL MANUFACTURERS' ADDRESSES

A

A. & A. Register Co., 8327 Clinton Rd., Cleveland 9, O.
ABC-Federal Oil & Burner Co., Inc., 2210 Walnut St., Philadelphia 3.
ACEC Electric Corp., 40 E. 49th St., New York 17, N. Y.
A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., 8 Pelham Parkway, Pelham Manor, N. Y.
A'G'A Div. of Elastic Stop Nut Corp. of America, 1027 Newark Ave., **Elizabeth 3, N. J.**
A-J Mfg. Co., 3601 E. 18th St., Kansas City 27, Mo.
A-P Controls Div., Controls Co. of America, 2450 N. 32nd St., Milwaukee 45, Wis.
A.R.A. Mfg. Co., P. O. Box 685, Grand Prairie, Tex.
Abart Gear & Machine Co., 4828-36 W. 16th St., Chicago 50, Ill.
Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y.
Abbott & Biddle Co., 2413 Federal St., Philadelphia 46, Pa.
Abbott Products, Inc., 150-50 Twelfth Ave., Whitestone 57, N. Y.
Able Metal Spinning & Stamping Co., 2009 Nameoke Ave., Far Rockaway 91, N. Y.
Accurate Sheet Metal & Mfg. Works, Inc., 2336-44 Milwaukee Ave., Chicago 47, Ill.
Accurate Specialties Co., Inc., 37-11 57th St., Woodside 77, N. Y.
Ace Engineering Co., 2850 W. Harrison, Chicago 12, Ill.
Ace Instrument Co., Inc., 172 Pacific St., Brooklyn, N. Y.
Ace-Sycamore, Inc., 448 DeKalb Ave., Sycamore, Ill.
Acer & Whedon, Inc., Medina, N. Y.
Acneson Mfg. Co., Braddock P. O., Rankin, Pa.
Acker Corp., P. O. Box 1310, Meridian, Miss.
Ackerman Gas Boiler Corp., S. Main St., & P. R.R., McDonald, Pa.
Ackermann Mfg. Co., Subsidiary of Wheeling Steel Corp., Wheeling, W. Va.
Acme Asbestos Covering & Flooring Co., 236 N. Elizabeth St., Chicago 7, Ill.
Acme Chemical Co., 2506 N. 32nd, Milwaukee 45, Wis.
Acme Electric Corp., Cuba, N. Y.
Acme Electric Heating Co., 1217 Washington St., Boston 18, Mass.
Acme Electric Welder Co., 2618 Fruitland Ave., Los Angeles 58, Calif.
Acme Engineering & Mfg. Corp., Box 1203, Muskogee, Okla.
Acme-Fisher Div., Broadway Rubber Corp., 529 E. Broadway, Louisville.
Acme Gauge & Instrument Co., Inc., 30 Main St., Brooklyn, N. Y.
Acme Industries, Inc., 600 N. Mechanic St., Jackson, Mich.
Acme Mfg. Co., 7500 State Rd., Philadelphia 36, Pa.
Acme Newport Steel Co., Ninth & Lowell Sts., Newport, Ky.
Acme Steel Co., 135th St. & Perry Ave., Chicago 27, Ill.
Acme Welding Div. of the United Tool & Die Co., 1031 New Britain Ave., West Hartford, Conn.
Acorn Refining Co., 8001 Franklin Ave., Cleveland, O.
Acro Div., Robertshaw-Fulton Controls Co., 2040 E. Main St., Columbus, O.
Acromark Co., 531 Morrell St., Elizabeth, N. J.
Acro Welder Mfg. Co., 1719 W. St. Paul Ave., Milwaukee 3, Wis.
Adam Electric Co., Frank. 3648 Windsor Pl., St. Louis 13, Mo.
Adams Co., The, E. 4th St., P. O. Box 268, Dubuque, Ia.
Adams Co., Inc., R. P., 468 Park Dr., Buffalo 17, N. Y.
Adams Mfg. Co., 1530 St. Clair Ave., Cleveland 14, O.
Adams Pipe Repair Products, 2453 Merced Ave., P. O. Box 3367, So. El Monte, Calif.
Addison Products Co., Addison, Mich.
Adelta Mfg. Co., Inc., 21 & Ellsworth, Philadelphia 46, Pa.
Adhesive Products Corp., 1660 Boone Ave., New York 60, N. Y.
Adhesive Tape Corp., 58 Seabring St., Brooklyn 31, N. Y.
Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.
Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Adre Co., The, 8980 Hawthorne Lane, Hales Corner 3, Wis.
Adsco Div., Yuba Consolidated Industries, Inc., 20 Milburn St., Buffalo 12, N. Y.
Advance Furnace Co., 2300 E. Douglas, Wichita 7, Kans.
Advance Pump Co., 1201-5th St., Berkeley 10, Calif.
Advance Relays, Product of Electronics Div., Elgin National Watch Co., 2435 N. Naomi St., Burbank, Calif.
Aemco Inc., 10 State St., Mankato, Minn.
Aerco Corp., Northvale, N. J.
Aerofin Corp., 101 Greenway Ave., Syracuse 3, N. Y.
Aeroil Products Company, Inc., 69 Wesley St., South Hackensack, N. J.
Aeroprojects, Inc., 310 E. Rosedale Ave., West Chester, Pa.
Aeroquip, Inc., 1225 W. Main St., Van Wert, O.
Aeroquip Corp., 300 S. East Ave., Jackson, Mich.
Aerotec Corp., The, Greenwich, Conn.
Aerovent Fan Co., Inc., Ash and Barlow Sts., Piqua, O.
Aerovox Corp., New Bedford, Mass.
Aetna Ball & Roller Bearing Co., Div. Parkersburg-Aetna Corp., 4600 W. Schubert, Chicago, Ill.
Afco Fitting Co., Div. of Curtis Mfg. Co., 5300 Harvard Ave., Cleveland 5, O.
Aget Mfg. Co., 1320 E. Church St., Adrian, Mich.
Agnew & Tomlinson, 51-04 Vernon Blvd., Long Island City 1, N. Y.
Airaterra (Roylyn Products), 620 Paula Ave., Glendale 1, Calif.
Air-Con Filter Corp., 622-26 National St., Memphis 12, Tenn.
Air Conditioning, Inc., 88 N. Highland Ave., Ossining, N. Y.
Air Conditioning Engineering Co., 44 First St., Cambridge 41, Mass.
Air Conditioning Equipment Corp., 219 E. 44th St., New York 17, N. Y.
Air Conditioning Products Co., 2340 W. Lafayette Blvd., Detroit 16.
Air Control Products, Inc., Coopersville, Mich.
Air Controls, Inc., Div. of Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Air-Cooling Engineering Co., P. O. Box 744, Evanston, Ill.
Aircraft Porous Media, Inc., 30 Sea Cliff Ave., Glen Cove, N. Y.
Air Devices, Inc., 185 Madison Ave., New York 16, N. Y.
Air Distribution Products Co., 8201 W. 3rd, Los Angeles 48, Calif.
Air-Factors, Inc., 1630 Industrial Park St., Covina, Calif.
Air Filter Corp., 4554 West Woolworth Ave., Milwaukee 18, Wis.
Air Heaters, Inc., 1004 Mahoning Bank Bldg., Youngstown, O.
Air-Loc Div., Clark, Cutler, McDermott Co., Franklin, Mass.
Air Reduction Sales Co., A Div. of Air Reduction Co., Inc., Socony Mobil Bldg., 150 E. 42nd St., New York 17, N. Y.
Air & Refrigeration Corp., 439 Madison Ave., New York 22, N. Y.
Aireactor Corp., 271 Madison Ave., New York 16, N. Y.
Aire-Foile Fan & Blower Co., 10047 West Fort, Detroit 9, Mich.
Airetool Mfg. Co., Springfield, O.
Airfan Engineering Co., 7401 Telegraph Rd., Los Angeles 22, Calif.
Airfloor Co. of California, Inc., 13729 East Rosecrans Blvd., Norwalk, Calif.
Airflow Co., 400 S. Stonestreet Ave., Rockville, Md.
Airgard Mfg. Co., 362 W. Erie St., Chicago 10, Ill.
Airguide Instrument Co., 2210 Wabansia Ave., Chicago 47, Il'
AirGuide Plastics Corp., 20 S. E. 3rd Ave., Miami 32, Fla.
Airjet Ventilator Co., 133 Industrias, San Clemente, Calif.
Airkem, Inc., 241 E. 44 St., New York 17, N. Y.
Airmaster Corp., 1801 W. Belle Plaine Ave., Chicago, Ill.
Airmatic Valve. Inc., 7317 Associate Ave., Cleveland 9. O.
Air-Maze Corp., Subsidiary of Rockwell-Standard Corp., 25000 Miles Rd., Cleveland 28, O.
Airolite Co., Marietta, O.
Air-O-Plastik Corp., 310 Seventeenth St., Union City, N. J.
Air-Path Products Co., 4620 Doll Ave., Baltimore 15, Md.
Air Pollution Control Div., John Wood Co., Essex Bldg., Bernardsville, N.J.
Air Products, Inc., 949 Hamilton St., Allentown, Pa.
Air Purification Service, Inc., 136 Liberty St., New York, N. Y.
Airserco Mfg. Co., 435 Melwood Ave., Pittsburgh 13, Pa.
Airtex Corp., 2900 North Western Ave., Chicago 18, Ill.
Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10, Mo.
Airtron Corp., Div. of the Higgins Metal Products Co., 2000 Broadway, Swanton, O.
Airwasher Corp., Eaton Rapids, Mich.
Ajax Boiler & Heater Co., 1519 W. 132nd St., Gardena, Calif.
Ajax Flexible Coupling Co., Inc., Westfield, N. Y.
Akron Metallic Gasket Co., 155 N. Union, P. O. Box 911, Akron 9, O
Alabama Pipe Co., Anniston, Ala.
Aladdin Heating Corp., 1111 West Ave., 137, San Leandro, Calif.
Alan Wood Steel Co., Conshohocken, Pa.
Albert Pipe Supply Co., Inc., 101 Varick Ave., Brooklyn 37, N. Y.
Albertson & Co., Inc., 3100 Lowell St., Sioux City 2, Ia.
Alco Products, Inc., Schenectady 5, N. Y.
Alco Valve Co., 865 Kingsland Ave., St. Louis 5, Mo.
Aldrich Co., 105 E. Williams St., Wyoming, Ill.
Aldrich Pump Co., 4 Pine St., Allentown, Pa.
Aljon Mfg. Co., Inc., 54-18 43rd St., Maspeth 78, N. Y.
Aljon Mfg. Co., Inc., 54-18 43rd St., Maspeth 78, N. Y
Allan Distributors, 27-11 49th Ave., Long Island City, N. Y.
Allcraft Mfg. Co., Inc., 27 Hayward St., Cambridge 42, Mass.
Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.
Allegheny Valve Co., 349 Pennsylvania Ave. W., Warren, Pa.
Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee 4, Wis.
Allen Co., Inc., L. B., 9307 Berenice, Schiller Park, Ill.
Allen Co., Robert G., P. O. Box 110, Mechanicsville, N. Y.
Allen Cooler & Ventilator, Inc., 704 Woodward, Rochester, Mich.
Allen Mfg. Co., W. D., 650 South 25th Ave., Bellwood, Ill.
Alliance Mfg. Co., Inc., Alliance, O.
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y
Allied Metal Hose Co., 3745 Ninth St., Long Island City 1, N. Y.
Allied Porcenell, Inc., 6641 S. Narragansett Ave., Chicago 38, Ill
Allied Precision Industries, Inc., 414 Stevens St., Geneva, Ill.
Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 25, Ind.
Allin Mfg. Co., 410 N. Hermitage Ave., Chicago, Ill.
Allington & Curtis Mfg. Co., 945 So. Towerline, Saginaw, Mich.
Allis-Chalmers Mfg. Co., 1171 S. 70th St., Milwaukee 1, Wis.
Allis Co., Louis, The, 427 E. Stewart St., Milwaukee 1, Wis.

Allison-Campbell Div. of American Chain & Cable Co., Inc., 924 Connecticut Ave., Bridgeport 2, Conn.
Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, Long Island, N. Y.
Alloy Propeller, Zelienople, Pa.
Alloy Rods Co., Lincoln Highway West, York, Pa.
Alloy Stainless Products Co., 607 Union Blvd., Totowa, N. J.
Alloy Steel Products Co., 1322 W. Elizabeth Ave., Linden, N. J.
Allpax Co., Inc., Mamaroneck, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Almar Hydraulic Valve Co., 10011 Meech Ave., Cleveland 5, O.
Alpha Metals, Inc., 56 Water St., Jersey City 4, N. J.
Alpha Plastics, Inc., 78 Okner Pkwy., Livingston, N.J.
Alphil Spot Welder Mfg. Corp., 1058 Pacific St., Brooklyn, N. Y.
Alstrom Corp., The, 790 E. 176 St., New York 60, N. Y.
Alter Co., Harry, 1717 S. Wabash Ave., Chicago, Ill.
Alton Mfg. Co., 1112 Ross Ave., Dallas 2, Tex.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
Aluminum Products, Inc., Fort Lauderdale, Fla.
Alumiseal Corp., 429 E. 53rd St., New York 22, N. Y.
Amana Refrigeration, Inc., Amana, Ia.
Amchem Products, Inc., Brookside Ave., Ambler, Pa.
Amco Plastic Pipe Co., 2002 Davis St., San Leandro, Calif.
Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.
American Agile Corp., P. O. Box 168, Bedford, O.
American Air Curtain Corp., 10408 Manchester Rd., St. Louis 22, Mo.
American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.
American Boa, Inc., 114 Liberty St., New York, N. Y.
American Blow Pipe Co., 3549 W. Cermak Rd., Chicago 23, Ill.
American Brass Co., 414 Meadow St., Waterbury 20, Conn.
American Car & Foundry Div. of ACF Industries, Inc., 750 Third Ave., New York 17, N. Y.
American Cast Iron Pipe Co., 2930 N. 16th St., Birmingham 7, Ala.
American Coal Burner and Wood Stoker Corp., 1133 W. Cornelia Ave., Chicago 13, Ill.
American Coils Co., Route 524, Lakewood Rd., Farmingdale, N. J.
American Comfort Mfg. Co., 2401 Main St., Evanston, Ill.
American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City 8, Mo.
American District Telegraph Co., 155 Sixth Ave., New York, N. Y.
American Engineering Co., Wheatsheaf Lane & Sepviva St., Philadelphia 37, Pa.
American Felt Co., Glenville, Conn.
American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20.
American Flow Control Corp., 2220 South Blvd., Houston, Tex.
American Foundry & Furnace Co., Washington St. at McClun, Bloomington, Ill.
American Furnace Co., 1300 Hampton Ave., St. Louis 10, Mo.
American Gas & Chemicals, Inc., Leak-Tec Div., 120 East End Ave., New York 28, N. Y.
American Gauge & Mfg. Co., 125 Bayard St., Dayton 1, O.
American Gilsonite Co., Municipal Airport P. O. Box 15, Salt Lake City 1, Utah.
American Hair & Felt Co., Room 322, Merchandise Mart, Chicago 54, Ill.
American Hard Rubber Co., Div. of Amerace Corp., Ace Rd., Butler, N. J.
American Hydrotherm Corp., 10-55 Jackson Ave., Long Island City 1.
American Hydrovac, Div. Pitz Foundry Inc., 290 Scholes St., Brooklyn 6, N. Y.
American Instrument Co., Inc., 8030 Georgia Ave., Silver Spring, Md.
American K. A. T. Corp., Subsidiary of Magnus Chemical Co., Inc., Garwood, N. J.
American Ladder & Scaffold Co., Inc., 5505 N. W. 7th Ave., Miami 38, Fla.
American Machine Products Co., 208½ S. 2nd Ave., Marshalltown, Ia.
American Machine Wks., Inc., 1320 Clark St., Racine, Wis.
American Manganese Bronze Co., Rhawn & Hegerman Sts., Philadelphia, Pa.
American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.
American Metal Works, Inc., P. O. Box 7027, New Orleans, La.
American Meter Co., Inc., 13500 Philmont Ave., Philadelphia 16, Pa.
American Meter Co., Pump Div., 13500 Philmont Ave., Philadelphia 16, Pa.
American Moistening Co., Cleveland, N. C.
American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26, Ill.
American Pipe Bending Machine Co., Inc., 17 Furnace St., Poultney, Vt.
American Pipe & Steel Corp., 2201 W. Commonwealth Ave., Alhambra, Calif.
American Pipe Tool Co., 4856 W. Kinzie St., Chicago 44, Ill.
American Platinum & Silver Div., Engelhard Industries, Inc., 231 New Jersey Railroad Ave., Newark, N. J.
American Potash & Chemical Corp., Aerosol & Refrigeration Div., 3000 W. 6th St., Los Angeles, Calif.
American Pulley Co., The, 4200 Wissahickon Ave., Philadelphia 29.
American Rock Wool Corp., 20 N. Wacker Dr., Chicago, Ill.
American Sand-Banum Co., Inc., 1 N. Merrick Ave., Merrick, N. Y.
American Sanitary Mfg. Co., 308 Latimer St., Abingdon, Ill.
American Screw Co., Willimantic, Conn.
American Sealants Co., 103 Woodbine St., Hartford 6, Conn.
American Silver Co., 36-07 Prince St., Flushing 54, N. Y.
American Sisalkraft Corp., 55 Starkey Ave., Attleboro, Mass.
American Smelting & Refining Co., Federated Metals Div., 120 Broadway, New York 5, N. Y.
American Solder & Flux Co., 19th and Willard Sts., Philadelphia 40, Pa.
American-Standard Air Conditioning Div., 40 W. 40th St., New York.
American-Standard Detroit Controls Div., 5900 Trumbull Ave., Detroit 8, Mich.
American-Standard Industrial Div., Detroit 32, Mich.
American-Standard Plumbing & Heating Div., 40 West 40th St., New York 18, N. Y.
American Steel & Wire Div., United States Steel, Rockefeller Bldg., Cleveland 13, O.
American Tube Products, Inc., 100 Pulaski St., West Warwick, R. I.
American Viscose Corp., 350 5th Ave., New York, N. Y.
American Vitrified Products Co., 700 National City Bank Bldg., Cleveland 10, O.
American Vulcathene Div. Nalge Co., Inc., 75 Panorama Creek Dr., Rochester, N. Y.
American Warming & Ventilating Co., 1017-1021 Summit St., Toledo 4, O.
American Water Softener Co., Lehigh Ave. and 4th St., Philadelphia 33, Pa.
American Wells Wks., 100 N. Broadway, Aurora, Ill.
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Ames Iron Works, Inc., Oswego, N. Y.
Amic Mfg. Corp., 21-25 44th Ave., Long Island City, N. Y.
Aminco Refrigeration Products, American Injector Co., 1000 E. McNichols, Detroit 3, Mich.
Ammco Tools, Inc., 2100 Commonwealth Ave., North Chicago, Ill.
Ammerman Co., Inc., S. Greeley St., Stillwater, Minn.
Ammo Products, Inc., 1100 20th St., N. W., Washington, D. C.
Ampco Metal, Inc., 1731 S. 38th St., Milwaukee 46, Wis.
Ampere Industries, 60 Boston St., Newark 3, N. J.
Ampion Corp., 4-88 47th Ave., Long Island City 1, N. Y.
Anaconda Aluminum Co., P. O. Box 1654, 1430 S. 13th St., Louisville 10, Ky.
Anaconda Metal Hose Div., American Brass Co., The, 698 South Main St., P. O. Box 791, Waterbury 20, Conn.
Analytical Measurements, Inc., 585 Main St., Chatham, N. J.
Anchor Coupling Co., Inc., 342 N. 4th., Libertyville, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., P. O. Box 311, New Albany, Ind.
Anchor Metal Co., Inc., 966 Meeker Ave., Brooklyn, N. Y.
Anchor Packing Co., 401 N. Broad St., Philadelphia 8, Pa.
Andale Co., 1740 Cherry St., Philadelphia 3, Pa.
Andersen Corp., Bayport, Minn.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., 1949 W. 96th St., Cleveland 2, O.
Anderson Brass Co., 100 S. Campbell, Detroit 9, Mich.
Anderson Chemical Co., Inc., 1620 Waterville Rd., Macon, Ga.
Anderson Deisel Engine Co., 6245 State Rd., Philadelphia 35, Pa.
Anderson Metals Corp., Twenty-Second & Harrison Sts., Kansas City 8, Mo.
Anderson-Prichard Oil Corp., Liberty Bank Bldg., Oklahoma City 2.
Anderson Products, Inc., 34 Crafts St., Newtonville 60, Mass.
Anderson-Snow Corp., 3863 N. Milwaukee Ave., Chicago 41, Ill.
Anderson-Stolz Corp., 1731 Walnut St., Kansas City 8, Mo.
Andrew Parts Mfg. Co., 32-70 31st St., Long Island City 6, N. Y.
Andrew Technical Supply Co., 7068 N. Clark St., Chicago, Ill.
Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Anesite Co., 3575 Touhy Ave., Lincolnwood, Chicago 45, Ill.
Anetsberger Bros., Inc., Northbrook, Ill.
Angier Adhesives, Div. of Interchemical Corp., 120 Potter St., Cambridge, Mass.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Anthony Co., End of Baker, Streator, Ill.
Anti-Corrosive Metal Products Co., Inc., Castleton-On-Hudson, N. Y.
Anti-Friction Bearings Co., 6433 Foster Bridge Rd., Bell Gardens, Calif.
Apex Reinforced Plastics, Washington & Elm Sts., Cleveland 13, O.
Applied Mechanics Co., 381 Congress St., Boston 10, Mass.
April Showers Co., Inc., 5980 Sligo Mill Rd., N. E., Washington 11, D. C.
Aqua Electric Scale Control, Inc., 2026 E. 22nd St., Cleveland 15, O.
Aqua Matic, Inc., 2412 Grant Ave., Rockford, Ill.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Arabol Mfg. Co., 110 E. 42nd St., New York 17, N. Y.
Arbest Mfg. Co., 3047 Amber St., Philadelphia 34, Pa.
Arcee Products, Pawtucket, R. I.
Arco Co., The, 7301 Bessemer Ave., Cleveland 27, O.
Arco Mfg. Co., 542 West 55th St., New York 19, N. Y.
Arco Products, Automotive Rubber Co., 12550 Beech Rd., Detroit, Mich.
Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.
Arden Airoflo Engineering, Inc., 2207 N. Chico Ave., El Monte, Calif.
Arens Controls, Inc., 2017 Greenleaf St., Evanston, Ill.
Arex Co., 612 N. Michigan Ave., Chicago 11, Ill.
Argo Industries, Inc., 524 Wethersfield Ave., Hartford, Conn.
Argo Plastic Products, 1400 West Tenth St., Cleveland 13, O.
Arjac Products Inc., 55-59 Halstead St., Rochester 10, N. Y.
Arkla Air Conditioning Corp., Shannon Bldg., 812 Main, Little Rock, Ark.
Arkos Mfg. Co., 7310 Woodward Ave., Detroit 2, Mich.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif.
Armour Industrial Chemical Co., Div. of Armour & Co., 110 N. Wacker Dr., Chicago 6, Ill.
Armstrong-Bridgeport Tool Mfg. Corp., 357-363 Cortlandt St., Belleville, N. J.
Armstrong Bros. Tool Co., 5200-5300 W. Armstrong Ave., Chicago 46, Ill.
Armstrong Co., Richard M., Box 566, West Chester, Pa.

Armstrong Contracting & Supply Corp., 2100 W. Fullerton Ave., Chicago 47, Ill.
Armstrong Cork Co., West Liberty St., Lancaster, Pa.
Armstrong Fittings Co., P. O. Box 1356, Des Moines, Ia.
Armstrong Furnace Co., Div. of National Union Electric Corp., 851 W. 3rd Ave., Columbus, O.
Armstrong Machine Wks., 874 Maple St., Three Rivers, Mich.
Arno Adhesive Tapes, Inc., 4100 Ohio St., Michigan City, Ind.
Aronson Machine Co., P. O. Box 307, Arcade, N. Y.
Arro Expansion Bolt Co., N. Boone Ave., Marion, O.
Arrow-Hart & Hegeman Elec. Co., 103 Hawthorne St., Hartford 6, Conn.
Arrowhead Products, Div. of Federal-Mogul-Bower Bearings, Inc., 2300 Curry St., Long Beach, Calif.
Art Valve Co., 4662 N. Lincoln Ave., Chicago 25, Ill.
Arvin Industries, Inc., Columbus, Ind.
Ashburn Supply Co., 8468 Warner Dr., Culver City, Calif.
Ashcraft Co., J. P., 5643 Dyer St., Dallas 6, Tex.
Assembly Products, Inc., Chesterland 1, O.
Associated Mills, Inc., 303 W. Monroe St., Chicago 6, Ill.
Associated Valve Co., 337 W. Walnut St., North Wales, Pa.
Aston Products, Inc., 22804 Dequindre, Warren, Mich.
Atcor, Inc., 24422 Ryan Rd., Warren, Mich.
Atkins Saw Div., Borg-Warner Corp., 402 S. Illinois St., Indianapolis 25, Ind.
Atkins Technical, Inc., 1276 W. Third St., Cleveland 13, O.
Atkomatic Valve Co., Inc., 545 W. Abbott St., Indianapolis 25, Ind.
Atlantic Engravers, Coldbrook Rd., Wilmington, Vt.
Atlantic Metal Hose Co., Inc., 308 Dyckman St., New York 34, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Anderson Ave., Moonachie, N. J.
Atlantic Steel Boiler Co., S. E. Cor. 22nd & Washington Ave., Philadelphia 46, Pa.
Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.
Atlas Copco Eastern, Inc., 610 Industrial Ave., Paramus, N. J.
Atlas Industries, Inc., P. O. Box 8152, Houston, Tex.
Atlas Mfg. Co., Eustis at Robbins St., St. Paul 14, Minn.
Atlas Mineral Products Co., 181 Walnut St., Mertztown, Pa.
Atlas Valve Co., 282 South St., Newark, N. J.
Atlas Welding Accessories, Inc., 707 E. Lewiston Ave., Ferndale 20, Mich.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Burner Co., Edgerton, O.
Auburn Foundry Inc., Heating Div., Auburn, Ind.
Auburn Machine Works, Inc., Auburn, Neb.
Auburn SparkPlug Co., Inc., Auburn, N. Y.
Auer Register Co., 6600 Clement Ave., Cleveland 5, O.
Aurora Pump Div., The New York Air Brake Co., 619 Loucks St., Aurora, Ill.
Austin Engineering & Mfg. Co., Inc., 8935 Roseway Dr., Ysleta (El Paso County), Texas
Austin Mfg. Corp., 305 Perry Brooks Bldg., Austin 1, Tex.
Au-Temp-Co Corp., 657 Broadway, New York 12, N. Y.
Auto-Control Laboratories, Inc., 333 So. Hindry Ave., Inglewood 1, Calif.
Autoclave Engineers Sales Corp., 2930 W. 22nd St., Erie, Pa.
Automatic Burner Corp., 1823 W. Carroll Ave., Chicago 12, Ill.
Automatic Control Co., 995 University Ave., St. Paul 4, Minn.
Automatic Devices, Div. of American Machine & Metals, Inc., 714 Hillgrove Ave., Western Springs, Ill.
Automatic Motor Base Co., Windsor, N. J.
Automatic Solid Fuels Equipment Inc., 2608 Madison, Indianapolis, Ind.
Automatic Sprinkler Corp. of America, Auto-Grip Div., Youngstown 1, O.
Automatic Switch Co., Florham Park, N. J.
Automatic Timing & Controls, Inc., King of Prussia, Pa.
Automation Products, Inc., 3030 Max Roy, Houston 24, Tex.
Automotive Rubber Co., Inc., 12550 Beech Rd., Detroit 39, Mich.
Autostributor Co., 226 Leslie St., Lansing 12, Mich.
Avon Tube Div., Higbie Mfg. Co., Ewing Rd., Rochester, Mich.
Axeman-Anderson Co., 233 West St., Williamsport 3, Pa.

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B-G Engineering Co., 5321 Long St., Houston, Tex.
Babbitt Chemical Co., 36 Prospect St., New Bedford, Mass.
Babbitt Steam Specialty Co., 1 Babbitt Sq., New Bedford, Mass.
Babcock & Wilcox Co., The, Boiler Div., 161 E. 42nd St., New York 17, N. Y.
Babcock & Wilcox Co., The, Tubular Products Div., Beaver Falls, Pa.
Bacharach Industrial Instrument Co., 200 North Braddock Ave., Pittsburgh 8.
Badger Fire Extinguisher Co., Chase St., Methuen, Mass.
Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass.
Badger Sales Co., Inc., 2251 W. Pico Blvd., Los Angeles 6, Calif.
Badham Insulation Co., Inc., 1909 — 1st Ave., S., Birmingham, Ala.
Bahnson Co., 1001 S. Marshall St., Winston-Salem 1, N. C.
Bailey Co., Chas. M., 667 Folsom St., San Francisco 7, Calif.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Co., Inc., The, 106 Granite St., Biddeford, Me.
Baker, Inc., C. I., 1205 Colorado Ave., Lorain, O.
Baker & Co., R. H., 2244 East 37 St., Los Angeles 58, Calif.
Bal-Air, Inc., 1210 McGavock St., Nashville, Tenn.
Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo.
Baldwin-Ehret-Hill, Inc., Valley Forge, Pa.
Baldwin Ward Mfg. Co., 1630 S. Main, Ottawa, Ks.
Balteau Electric Corp., New & Meadow Sts., Stamford, Conn.
Baltimore Aircoil Co., Inc., P. O. Box 7322, Baltimore 3, Md.
Band-It Co., 4799 Dahlia, Denver 16, Colo.
Banister Co., Inc., 23 Charles St., Cambridge 41, Mass.
Barber-Colman Co., 1701 Rock St., Rockford, Ill.
Barber Mfg. Co., 1058 E. 134th St., Cleveland 10, O.
Bar-Brook Mfg. Co., Inc., 6133 Linwood Ave., Shreveport, La.
Barclay, Inc., Robert, 1234 W. Fulton St., Chicago 7, Ill.
Barco Mfg. Co., 500 Hough St., Barrington, Ill.
Bard Mfg. Co., Bryan, O.
Barkow Mfg. Co., Inc., Aug. G., 2230 South 43rd St., Milwaukee 46, Wis.
Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58, Calif.
Barnebey-Cheney Co., Cassady at East 8th Ave., Columbus 19, O.
Barnes & Jones, Inc., 34 Crafts St., Newtonville, Mass.
Barnes Manufacturing Co., Mansfield, O.
Barnes Tool Co., The, 31 Fletcher Ave., Lexington 73, Mass.
Barnstead Still & Fertilizer Co., Lanesville Terrace, Boston 31, Mass.
Barreled Sunlight Paint Co., 43 Dudley St., Providence 1, R. I.
Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Barrett Haentjens & Co., Hazleton, Pa.
Barry Blower Co., 3100 California St., N.E., Minneapolis, Minn.
Barry Controls, Inc., 765 Pleasant St., Watertown 72, Mass.
Bart Mfg. Corp., 227 Main St., Belleville 9, N. J.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2, Mich.
Barton Instrument Corp., 580 Monterey Pass Rd., Monterey Park, Calif.
Barwick Mfg. Corp., 317 E. 18th, Wichita, Kan.
Barworth, Inc., 681 Morris Turnpike, Springfield, N. J.
Baseline Mfg. Corp. of Fla., P. O. Box 10666, St. Petersburg 33, Fla.
Baseline Mfg. Co., 2701 E. 78th St., Minneapolis, Minn
Basford Co., H. R., 235 15th St., San Francisco, Calif.
Basic Engineers, Inc., 1007 Main St., Sharpsburg 15, Pa.
Basic Inc., 845 Hanna Bldg., Cleveland 15, O.
Baso Inc., P. O. Box 461, Milwaukee, Wis.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bate Soot Blower Div., General Blower Co., Inc., 6412 Girard Ave., Philadelphia 31, Pa.
Bath Co., Cyril, The, 32400 Aurora Rd., Solon, O.
Bausch & Lomb Optical Co., 63360 Bausch St., Rochester 2, N. Y.
Bayer Co., 4030 Chouteau Ave., St. Louis 10, Mo.
Bayley Blower Co., 6600 W. Burnham St., Milwaukee 14, Wis.
Beach-Russ Co., 420 Lexington St., New York 17, N. Y.
Beacon Brass Co., 2 Jackson, Waltham, Mass.
Beacon-Morris Corp., 60 Brainerd Rd., Allston, Boston 34, Mass.
Beaird Co., J. B., 6200 St. Vincent Ave., Shreveport, La.
Bear Mfg. Co., Industrial Div., 2030 5th Ave., Rock Island, Ill.
Bearing Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., 501 Harrisburg Ave., Lancaster, Pa.
Beaton & Cadwell Mfg. Co., 185 Main St., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Beaver Advance Corp., Ellwood City, Pa.
Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, O.
Beckett & Co., Inc., Thomas, 2521 Willowbrook Rd., P. O. Box 13,245, Dallas 9, Tex.
Beckett Corp., R. W., Elyria, O.
Beckley Perforating Co., 301 North Ave., Garwood, N. J.
Beckman & Whitley, Inc., 973 San Carlos Ave., San Carlos, Calif.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., 100 Pennsylvania Ave., Paterson 3, N. J.
Belco Industries, Inc., 316 South 16th St., St. Louis 3, Mo.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Bell Machine Specialties, 4813 Tremont Ave., Trevose, Pa.
BelloFram Corp., Blanchard Rd., Burlington, Mass.
Belmont Packing & Rubber Co., The, Butler & Sepviva Sts., Philadelphia 37, Pa.
Belmont Smelting & Refining Wks., Inc., 349 Belmont Ave., Brooklyn 7, N. Y.
Belt-Ice Corp., 3400 16th W., Seattle, Wash.
Beltran Associates, Inc., 1133 East 35th St., Brooklyn 10, N. Y.
Bemco, Inc., 11631 Vanowen St., North Hollywood, Calif.
Bemis Bro. Bag Co., 408 Pine St., Box 111, St. Louis 2, Mo.
Bendix Aviation Corp., Cincinnati Div., 3130 Wasson Rd., Cincinnati 8, O.
Bendix Filter Div., Bendix Aviation Corp., 434 W. 12 Mile Rd., Madison Heights, Mich.
Bendix-Westinghouse Automotive Air Brake Co., 950 E. Virginia St., Evansville, Ind.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4, Mo.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex. R., Middlesettlement Rd., New Hartford, N. Y
Bergen Pipesupport Corp., 50 Church St., New York 7, N. Y.
Berger Bros. Co., 229-237 Arch St., Philadelphia 6, Pa.
Berkeley Pump Co., P. O. Box 7, Station A, Berkeley 2, Calif.
Berko Electric Mfg. Co., 212-40 Jamaica Ave., Queens Village 28, N. Y.
Berlin Chapman Co., Berlin, Wis.
Berna Co., A. J., 15251 Twelve Mile Rd., Roseville, Mich.
Berna Corp., Garwood, N. J.
Bernard-Franklin Co., Inc., 3126 E. Hedley St., Philadelphia 37, Pa.
Bernstrom, Inc., C. R., 183 Hartford Ave., Providence, R. I.
Bernz Co., Otto, Driving Park & Ramona, Rochester 13, N. Y.
Berry-Hill Corp., Hill Diesel Engine Div., 1 Washington Ave., Providence, R. I.
Bertram Co., Harvey P., The, 2225 Bogen St., Cincinnati 22, O.
Bertsch & Co., Inc., Church St., Cambridge City, Ind.
Besser Furnace and Air Conditioning Corp., 754 Clement Ave., Charlotte, N. C.
Best Combustion Equipment Co., Inc., W. N., 85 Industrial Ave., Little Ferry, N. J.
Bestt Rollr Co., 160 S. Brooke St., Fond du Lac, Wis.
Bete Fog Nozzle Inc., 309 Wells St., Greenfield, Mass.
Bethlehem Foundry & Machine Co., Bethlehem, Pa.

Bethlehem Steel Co., Bethlehem, Pa.
Bettcher Mfg. Corp., 3106 W. 61st St., Cleveland 2, O.
Better Engineered Controls, 1822 S. Burlington Ave., Los Angeles 6, Calif.
Beverly Shear Mfg. Co., 3019 W. 111th St., Chicago 43, Ill.
Bica Co., 1170 N. State St., Girard, O.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
B-I-F Industries, Omega Div., 381 Harris Ave., Providence 1, R. I.
B-I-F Industries, Proportioneers Div., 381 Harris Ave., Providence 1, R. I.
Bigelow Co., The, 174 River St., New Haven 3, Conn.
Bigelow Liptak Corp., 13300 Puritan Ave., Detroit 27, Mich.
Biggs Boiler Wks. Co., The, 1007 Bank St., E. Akron 5, O.
Bignall & Keeler Div., John Ramming Machine Co., 4591 McRee Ave., St. Louis 10, Mo.
Bil-Jax, Inc., Archbold, O.
Billings & Spencer Co., 1 Laurel St., Hartford 1, Conn.
Binks Mfg. Co., 3114-40 Carroll Ave., Chicago 12, Ill.
Birchfield Boiler, Inc., 2503 E. 11th St., Tacoma 1, Wash.
Bird-Archer Co., 4337 North American St., Philadelphia 40, Pa.
Birks Mfg. Co., 811 Hanover Rd., Meriden, Conn.
Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14, O.
Bishopric Products Co., 4413 Este Ave., Cincinnati 32, O.
Bituminous Coal Institute, Southern Bldg., Washington 5, D. C.
Black & Decker Mfg. Co., The, 628 Pennsylvania Ave., Towson 4, Md.
Black Mfg. Co., The, 403 Penn St., Baltimore 30, Md.
Black, Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.
Black & White Chemical Co., 130 Walnut Ave., New York 54, N. Y.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 46, Wis.
Blackmer Pump Co., 1809 Century Ave., S. W., Grand Rapids 9, Mich.
Blaw Knox Co., Buflovak Equipment Div., 50 Winchester Ave., Buffalo 11, N. Y.
Blaw Knox Co., Power Piping and Sprinkler Div., 829 Beaver Ave., Pittsburgh 33, Pa.
Blazer & Son, M., 173 Market St., Passaic, N. J.
Blissfield Mfg. Co., Route No. 3, Blissfield, Mich.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Blossom Mfg. Co., Inc., 2337 McDonald Ave., Brooklyn 23, N. Y.
Blower Application Co., 3361 N. 35th St., Milwaukee 16, Wis.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., 177 Westfield Ave., W., Roselle Park, N. J.
Bluffton Electric Co., Bluffton, Ind.
Bock Corp., 110 S. Dickinson St., Madison, Wis
Bodine Electric Co., 2500 W. Bradley Place, Chicago 18, Ill.
Bohn Aluminum & Brass Corp., 1400 Lafayette Bldg., Detroit, Mich.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Boiler Engineering & Supply Co., Manavon St., Phoenixville, Pa.
Boiler Equipment Trust, Amherst, Mass.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Bonney Forge & Tool Wks., Cedar & Meadow Sts., Allentown, Pa.
Borden Co., The, Chemical Div., Coatings & Adhesives Div., Lincoln Blvd., Middlesex, N J
Bordo Co., Inc., L. J., 106 N. Keswick Ave., Glenside, Pa.
Borg-Warner Mechanical Seals, Div. of Borg-Warner Corp., P. O. Box 2017A, Terminal Annex, Los Angeles 54, Calif.
Borm Mfg. Co., 23 N. Union St., Elgin Ill.
Bostitch, East Greenwich, R. I.
Boston Gear Works, Quincy 71, Mass.
Boston Machine Works Co., 7 Willow St., Lynn, Mass.
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., 29 Hampshire St., Cambridge, Mass.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47, Pa
Boulin Instrument Corp., 10 First St., Pelham, N. Y.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bowen Engineering, Inc., North Branch, N. J.
Bowerston Shale Co., The, P O. Box 2, Bowerston, O.
Bowman Steel Corp., P. O. Box 2129, Pittsburgh 30, Pa.
Boylston Steam Specialty Co., 116-122 W. Illinois St., Chicago, Ill.
Brabender Corp., Rochelle Park, N. J.
Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 9, Wis.
Brandt Corp., The, 50-20 25th St., Long Island City 1, N. Y.
Brass & Copper Imports, Inc., 4410 W. Lake Harriet Blvd., Minneapolis, Minn.
Breeze Corporations, Inc., Union, N. J.
Breidert Co., G. C., P. O. Box 1190, San Fernando, Calif.
Bremil Mfg. Co., 1020 Holland St., Erie, Pa.
Bressler Engineering Service, Oregon, Ill.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Brass Co., Hunter Douglas Div., 405 Lexington Ave., New York 17, N. Y.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., 155 Hill St., Milford, Conn
Brisk Metal Products, 720 Grand Ave., Ridgefield, N. J.
Bristol Co., The, P. O. Box 1790, Dept. HPAC, Waterbury, Conn.
Broad Crane & Engineering Service Co., 779 S. Dumfries, Detroit 17, Mich.
Broan Mfg. Co., Inc., P. O. Box 140, Hartford, Wis.
Bronson Fan Mfg. Corp., 4560 Worth St., Los Angeles, Calif.
Bronze Bearings, Inc., 340 North Ave., Cranford, N J.
Brook Motor Corp., 3302-04 W. Peterson Ave., Chicago 45, Ill.
Brooke Engineering Co., Inc., 4517 Wayne Ave., Philadelphia 44, Pa.
Brookfield Engineering Laboratories, Inc., 240 Cushing St., Stoughton, Mass.
Brooklyn Paint & Varnish Co., Inc., 50 Jay St., Brooklyn 1, N. Y.
Brooks Equipment Corp., 217 Hudson St., Hoboken, N. J.
Brooks Rotameter Co., P. O. Box 432, Lansdale, Pa.
Brookside Corp., McCordsville, Ind.
Bros Inc., 1057 10th Ave., S. E., Minneapolis 14.
Brown Co., 150 Causeway St., Boston 14, Mass.
Brown-Brockmeyer Co., Inc., P. O. Box 989, Dayton 1, O.
Brown Fintube Co., Elyria, O.
Brown Products Corp., 1090 Springfield Road, Union, N.J.
Browning Mfg. Co., 1940 Browning Blvd., Maysville, Ky.
Brundage Co., The, 503 N. Park St., Kalamazoo 11, Mich.
Bruner Corp., 4763 N. 32nd St., Milwaukee 9, Wis.
Bruning Co., Inc., Charles, 1800 W. Central Rd., Mt. Prospect, Ill.
Brunner Div. of Dunham-Bush, Inc., 179 South St., West Hartford, Conn.
Bryan Steam Corp., P. O. Box 364, Peru, Ind.
Bryant Mfg. Co., 2020 Montcalm St., Indianapolis, Ind.
Bubar Dust Systems, Old Lyme, Conn.
Buck Mfg. Co., 1355 North Tenth St., San Jose, Calif.
Buckeye Mfg., Inc., 897 Ingleside, Columbus 8, O.
Buckeye Tools Corp., 5070 Springboro Pike, Dayton, O.
Budlew Products Co., 3535 W. Cortland, Chicago, Ill.
Buell Engineering Co., Inc., 123 Williams St., New York 38, N. Y.
Buensod-Stacey, Inc., 45 W. 18th St., New York 11, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda N. Y.
Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Meter Co., Inc., 2917 Main St., Buffalo 14, N. Y.
Buffalo Pumps, Div. of Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Tank Corp., South Ave., Dunellen, N. J.
Builders-Providence Div., B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
Building Service Co., 4293 18th Ave., S., Minneapolis 17, Minn.
Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Bunker Hill Co., The, Sales & Fabrication Div., 660 Market St., San Francisco 4, Calif.
Burden Co., Alan E., 1940 Pontius Ave., Los Angeles 34, Calif.
Burdett Mfg. Co., 4920 S. Monitor, Chicago 38, Ill.
Burdett Oxygen Co. of Calif., 2014 Belgrave Ave., Huntington Park, Calif.
Burgess-Manning Co., Architectural Products Div., 749 E. Park Ave., Libertyville, Ill.
Burke & Co., 2902 Hyde Park Blvd., Los Angeles 43, Calif.
Burling Instrument Co., Air Conditioning Div., 16 River Rd., Chatham, N. J.
Burlis Products Co., 804 Hopkinson Ave., Brooklyn 12, N. Y.
Burnett, Jr., Inc., J. F., 928 Jefferson Ave., Rochester, N. Y.
Burnham Corp., Main St., Irvington, N Y.
Burr Oak Tool & Gauge Co., P. O. Box 471, 1009 Prairie Ave., Sturgis, Mich.
Burrows Mfg. Co., F. A., P. O. Box 725, York, Pa.
Burt Mfg. Co., 41 E. South St., Akron 11, O.
Burtchaell Heating Co., 2944 S. E. Powell, Portland, Ore.
Burton Mfg. Co., Middlefield, O.
Bury Compressor Co., 18th & Cascade Sts., Erie, Pa.
Buxton Mfg. Co., P. O. Box 94, Dover, N. J.
Ry-Buk Co., 4314 West Pico Blvd., Los Angeles 19, Calif.
Byers Co., A. M., Clark Bldg., Pittsburgh 22, Pa.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., P O Box 2017, Terminal Annex, Los Angeles 54.

C

CCA Products, Inc., P. O. Box 671, Glendale 5, Calif.
C & H Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta 6, Ga.
C.L.B. Co., 1917 Portsmouth, P. O. Box 6031, Houston 6, Tex.
Cabot, Inc., Samuel, 141 Milk St., Boston 9, Mass.
Cady Metal Fabricating Co., 88 Schenck St., North Tonawanda, N. Y.
Cain Mfg. Inc., 1111 N. 5th Ave., Birmingham 4, Ala.
Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Pa.
Calculator Specialties Co., 122 S. Michigan Ave., Chicago 3, Ill
Caldwell Co., W. E., 2120 Brook St., Louisville, Ky.
Calgon Co., Div. of Hagan Chemicals & Controls, Inc., P. O. Box 1346, Hagan Bldg., Pittsburgh 30, Pa.
California Brass Mfg. Co., 1447 Naud St., Los Angeles 12, Calif.
Caliputer, P. O. Box 586, Rancho Santa Fe, Calif.
Cambridge Filter Corp., 732 E. Erie Blvd., Syracuse 1, N. Y.
Camco Fittings, Inc., 301 State St., North Haven, Conn.
Camdale Corp., 828 Niels Esperson Bldg., Houston, Tex.
Cameron Iron Works, Inc., P O Box 1212, Houston, Tex.
Cam-Lok Div., Empire Products, Inc., P. O. Box 98, Cincinnati 36, O
Camloc Fastener Corp., 22 Spring Valley Rd., Paramus, N. J.
Campbell Co., E. K., Manchester at 18th, Kansas City 26, Mo.
Campbell Co., J. A., 645 E. Wardlow Rd., Long Beach 7, Calif.
Campbell Heating Co., 3121 Dean Ave., Des Moines 17, Ia.
Cam-Stat, Inc., Div of The Paul Henry Co., 11833 West Olympic Blvd., Los Angeles 64, Calif.
Can Arm Corp., P. O. Box 156, Champlain, N. Y.
Cannon Chemical Co., Inc., 181 Portland St., Cambridge 41, Mass.
Canton Stoker Corp., 2400 Andrew Place, S. W., Canton 1, O
Canvas Products Co., 2115 Locust St., St. Louis 3, Mo.
Capac Mfg. Corp., P. O. Box 186, Capac, Mich.
Capitol Mfg. Co., Div. of Harsco Corp., 153 W. Fulton St., Columbus, O.
Carboline Co., The, 32 Hanley Ind. Court, St. Louis 17, Mo.
Cardox Corp., 307 N Michigan Ave., Chicago, Ill.
Cardwell Machine Co., 1901 E. Franklin St., Richmond 11, Va.
Carey Electronic Engineering Co., Metal Wool Div., 1880 Clifton Ave., Springfield, O.
Carey Mfg. Company, Philip, Wayne Ave., Lockland, Cincinnati 15, O.
Cargocaire Engineering Corp., 15 Park Row, New York 38, N. Y.
Carlen Associates, 40 West 57th St., New York, N. Y.
Carlin Co., The, 912 Silas Deane Hwy., Wethersfield 9, Conn.
Carling Turbine Blower Co., 8 Nebraska St., Worcester, Mass.

Carlon Products Corp., P. O. Box 133, Aurora, O.
Carlson Rules Works, Disston Div., H. K. Porter Co., (Delaware), 1617 California St., Monrovia, Calif.
Carnes, Inc., John R., Greenlawn Ave. & Erie R. R., Lima, O.
Carnes Corp., Verona, Wis.
Carney Co., Inc., The, Mankato, Minn.
Carolina Aniline & Extract Co., 301 S. Cedar St., Charlotte, N. C.
Carolina Blower Co., Inc., 428-436 Morehead Ave., Greensboro, N. C.
Carpenter Heating & Air Conditioning Co., 2135 St. Clair Ave., Cleveland 14, O.
Carpenter & Paterson, Inc., 18 Hurley St., Cambridge 41, Mass.
Carpenter Sales Corp., 4545 E. 71st St., Cleveland 5, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Carr Fastener Co., Div. of United Carr Fastener Corp., 31 Ames St., Cambridge, Mass.
Carrier Corp., Carrier Parkway, Syracuse 1, N. Y.
Carter Controls, Inc., 2800 Bernice Road, Lansing, Ill.
Carvell Heat Equipment Co., 1217 Temple St., Los Angeles 26, Calif.
Carver Pump Co., 1460 Hershey Ave., Muscatine, Ia.
Cash Co., A. W., P. O. Box 551, Decatur, Ill.
Cash Valve Mfg. Corp., A. W., 6621 E. Wabash Ave., Decatur, Ill.
Cashin Co., W. D., 69 A. St., Boston 27, Mass.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Cauhorn Distributing Co., 20722 W. Seven Mile, Detroit 19, Mich.
Cavalier Corp., Electric Heating Div., 343 West First St., Chattanooga, Tenn.
Ceilcote, Inc., 4832 Ridge Rd., Cleveland 9, O.
Ceilheat, Inc., 5212 Homberg Drive, Box 10066, Knoxville, Tenn.
Celanese Corp. of America, P. O. Box 1414, Charlotte, N.C.
Celotex Corp., The, 120 S. La Salle St., Chicago 3, Ill.
Cement Lined Pipe Co., 93 Brookline St., Lynn, Mass.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago, Ill.
Central Foundry Co., The, 932 Broadway, New York 10, N. Y.
Central Iron & Wire Works, 401 S.E. 4th St., Des Moines 16, Ia.
Central States Steel Boiler Co., 4649 W. Harrison St., Chicago 44, Ill.
Central Station Steam Co., 2920 E. Woodbridge St., Detroit 7, Mich.
Central Steel & Wire Co., P. O. Box 5310-A, Chicago 80, Ill.
Central Transformer Corp., P. O. Box 1753, Pine Bluff, Ark.
Centrifix Corp., 3608 Payne Ave., Cleveland 14, O.
Centri-Spray Corp., 39001 Schoolcraft Rd., Livonia, Mich.
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Century Engineering Corp., 401 3rd St., S. E., Cedar Rapids, Ia.
Century Fan & Ventilator Co., Inc., 45 Cedar St., Stamford, Conn.
Century Instrument Co., 220 East Milwaukee St., Detroit, Mich.
Cepi-American, Inc., 4053 May St., Hillside, Ill.
Certified Flexible Couplings, Inc., 39 N. Bond St., Mt. Vernon, N. Y.
Chace Co., W. M., 1606 Beard Ave., Detroit 9, Mich.
Chain Belt Co., 4621 W. Greenfield, Milwaukee 1, Wis.
Chamberlin Co. of America, 13534 Woodward Ave., Detroit 3, Mich.
Champion Blower & Forge Co., Harrisburg Ave., and Charlotte St., Lancaster, Pa.
Champion-DeArment Tool Co., Meadville, Pa.
Champion Furnace Pipe Co., 120 Morton St., P. O. Box 950, Peoria, Ill.
Champion Pneumatic Machinery Co., 825 N. Pleasant St., Princeton, Ill.
Channel Master Corp., Ellenville, N. Y.
Chaplin-Fulton Mfg. Co., 5800 Grand Ave., Pittsburgh 25, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Char-Gale Mfg. Co., 4325 Hiawatha Ave., Minneapolis 6, Minn.
Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
Chatleff Valve & Mfg. Co., 205 Industrial Blvd., Austin 66, Tex.
Chelsea Fan & Blower Co., Inc., Subsidiary of Chelsea Products, Inc., 639 South Ave., Plainfield, N. J.
Chelsea Metal Stamping Co., 95 8th Ave., New York 11, N. Y.
Chem Industrial Co., Brooklyn 9, O.
Chemical Coatings & Engineering Co., 221 Brooke St., Media, Pa.
Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Chemical Solvent Co., 3005 N. 16th St., Birmingham, Ala.
Chemical Specialty Div. of Shooz Polish Mfg. Co., 1013 W. Oklahoma Ave., Milwaukee 15, Wis.
Chemiquip Co., 36 E. 10th St., New York 3, N. Y.
Chemtrol, 10872 Stanford Ave., Lynwood, Calif.
Cheney Flashing Co., 623 Prospect St., Trenton 5, N. J.
Chesapeake & Ohio Railway Co., Terminal Tower, Cleveland 1, O.
Chesflex Div., St. Regis Paper Co., 684 Nepperhan Ave., Yonkers, N. Y.
Chester Cable Corp., Chester, N. Y.
Chesterton Co., A. W., 6 Ashland St., Everett 49, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., 113-125 N. Green St., Chicago 7, Ill.
Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.
Chicago Die Casting Mfg. Co., 2510-14 W. Monroe St., Chicago 12, Ill.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
Chicago Float Works, Not Inc., Dept. T., 2330 S. Western Ave., Chicago 8, Ill.
Chicago Forging and Mfg. Co., 2000 Southport Ave., Chicago 14, Ill.
Chicago Gasket Co., 1271 West North Ave., Chicago 22, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32, Ill.
Chicago Metallizing Co., 3321 S. Pulaski Rd., Chicago, Ill.
Chicago Molded Products Corp., 2733 N. Normandy Ave., Chicago, Ill.
Chicago Nipple Mfg. Co., 650 Lake St., Oak Park, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., 622 Diversey Pkwy., Chicago 14, Ill.
Chicago Specialty Mfg. Co., 2954 Lawrence Ave., Chicago 25, Ill.
Chicago Steel Furnace Company, 9326 S. Anthony Ave., Chicago 17, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc. 6400 W. 66th, Chicago 38, Ill.
Chicago Ventilator Co., 2943 W. Carroll Ave., Chicago 12, Ill.
Chicago-Wilcox Mfg. Co., 7701 Avalon Ave., Chicago 19, Ill.
Chicopee Mills, Inc., 47 Worth St., New York, N. Y.
Chiksan Co., Brea, Calif.
Childers Mfg. Co., P. O. Box 7467, Houston 8, Tex.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Chrysler Airtemp Div. of Chrysler Corp., 1600 Webster St., Dayton 1, O.
Cincinnati Electrical Tool Co., The, 300 Mt. Hope Ave., Cincinnati 8, O.
Cincinnati Fan and Ventilating Co., 3548 Montgomery Ave., Cincinnati.
Cincinnati Metalcrafts Inc., 5000 Brotherton Rd., Cincinnati 9, O.
Cincinnati Shaper Co., P. O. Box 111, Cincinnati 11, O.
Cincinnati Time Recorder Co., 1733 Central Ave., Cincinnati 14, O.
Circle-Air Industries, Inc., 244 Herkimer St., Brooklyn 16, N. Y.
Circle Clamp Div., Cuyahoga Products Corp., 10252 Berea Rd., Cleveland 2, O.
Circle Seal Products Co., Inc., 2181 E. Foothill Blvd., Pasadena 8, Calif.
Circuit Protective Devices Dept., General Electric Co., Woodford Ave., Plainville, Conn.
Cissell Mfg. Co., W. M., 831 South First St., P. O. Box 1143, Louisville 1, Ky.
Clarage Fan Co., Porter St., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Controller Co., 1146 E. 152nd St., Cleveland 10, O.
Clark-Cooper Co., Inc., CC Pump Div., Market-Madison Sts., Palmyra, N. J.
Clark Flexible Link Shaft Co., P.O. Box 73, Newton Highlands 61, Mass.
Clark Mfg. Co., 1830 E. 38th St., Cleveland 14, O.
Claronex Products, Inc., 239 Java St., Brooklyn 22, N. Y.
Clauss Cutlery Co., Fremont, O.
Cla-Val Co., 17th & Placentia, Newport Beach, Calif.
Clay Equipment Corp., Cedar Falls, Ia.
Clayton & Lambert Mfg. Co., 1701 Dixie Hwy., Louisville 10, Ky.
Clayton Mfg. Co., 401 N. Temple City Blvd., El Monte, Calif.
Clayton Mark & Co., 1900 Dempster, Evanston, Ill.
Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.
Cleveland Brass Mfg. Co., The, P. O. Box 158, Kinsman, O.
Cleveland Controls, Inc., 1111 Brookpark Rd., Cleveland 9, O.
Cleveland Crane & Eng. Co., 5866 E. 289th St., Wickliffe, O.
Cleveland Graphite Bronze, Div. of Clevite Corp., 17000 St. Clair Ave., Cleveland 10, O.
Cleveland Heater Co., The, 2310 Superior Ave., Cleveland 14, O.
Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3, O.
Cleveland Punch & Shear Works Co., E. 40th and St. Clair Ave., Cleveland 14, O.
Cleveland Worm & Gear Co., 3300 E. 80th St., Cleveland 4, O.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., 152 Grove St., Waltham 54, Mass.
Climax Metal Products Co., 863 E. 140 St., Cleveland 10, O.
Clinton Metallic Paint Co., Clinton, N. Y.
Clipper Mfg. Co., 65 E. 28th St., Kansas City 8, Mo.
Clover Industries Inc., Dept. 1, 588 Young St., Tonawanda, N. Y.
Clow & Sons, Inc., James B., 201-299 N. Talman Ave., Chicago 12, Ill.
Cobell Industries, Inc., 600 South Wilhite St., Cleburne, Tex.
Cobra Metal Hose Div., D-K Mfg. Co., 5059 S. Kedzie, Chicago, Ill.
Cobra Pipe Supply & Coil Co., Inc., Brook St., P. O. Box 176, Elmwood 10, Conn.
Cochrane Corp., 3131 N. 17th St., Philadelphia 32, Pa.
Coe Mfg. Co., Bank St., Painesville, O.
Coen Co., 40 Boardman Pl., San Francisco 3, Calif.
Coffin Co., Jr., J. S., 326 S. Dean St., Englewood, N. J.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Cole-Sewell Engineering Co., 2288 University Ave., St. Paul 14, Minn.
Coleman Co., Inc., The, 250 N. St. Francis St., Wichita 1, Kans.
Colgate Co., Charles A., 528 Washington Rd., Pittsburgh 28, Pa.
Collins Machinery Corp., 5474 Alhambra Ave., Los Angeles 32, Calif.
Colonial Plastics Mfg. Co., Industrial Div., 2685 E. 79th St., Cleveland 4, O.
Color-Art Printing & Stationery Co., 201 South Kirkwood Rd., Kirkwood 22, Mo.
Colt Ventilation of America, Inc., 4652 Hollywood Blvd., Los Angeles 27, Calif.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Columbia Cement Co., 150 Ingraham St., Brooklyn, N. Y.
Columbia Electric Mfg. Co., 4519 Hamilton Ave., Cleveland 14, O.
Columbia Engineering Service Co., 4025 Sebastopol Hiway, Santa Rosa, Calif.
Columbia-Geneva Steel Div., United States Steel Corp., 120 Montgomery St., San Francisco 6, Calif.
Columbian Vise & Mfg. Co., 9021 Bessmer, Cleveland, O.
Columbus Steam Pump Wks. Co., 724 W. Gay St., Columbus 22, O.
Combination Pump Valve Co., 851 Preston St., Philadelphia 4, Pa.
Combustion Engineering Inc., 200 Madison Ave., New York 16, N. Y.
Combustion Equipment Co., 1202 15th St., Moline, Ill.
Comfort Products Inc., P. O. Box 8568, 440 Hillburn Dr., Dallas 16, Tex.
Commercial Filters Corp., 2 Main St., Melrose 76, Mass.
Commercial Plastics Co., 945 George St., Chicago 14, Ill.
Commercial Shearing & Stamping Co., 1775 Logan, P. O. Box 239, Youngstown 1, O.
Commercial Solvents Corp., 260 Madison, New York, N. Y.
Commercialaire Corp. of America, 840 E. 98th St., Brooklyn 36, N. Y.
Committee on Steel Pipe Research, American Iron and Steel Institute, 150 E. 42nd St., New York 17, N. Y.
Commonwealth Brass Corp., 5781-5835 Commonwealth Ave., Detroit 8.
Cond-Air Div., Elliott Engineering Co., 2800 E. Century Blvd., Lynwood, Calif.
Condensation Engineering Corp., 3511 W. Potomac Ave., Chicago 31.
Condenser Service & Engineering Co., Inc., 150 Observer Highway, Hoboken, N. J.
Conditioned Air, Inc., P. O. Box 2429, Charleston, W. Va.

Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.
Connor Engineering Corp., Danbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Dept. P, 2100 Arch St., Philadelphia 3, Pa.
Consolidated Diesel Electric Corp., Canal & Ludlow Sts., Stamford, Conn.
Consolidated General Products, Inc., 24th & Nicholson Sts., Houston 8.
Consolidated Pipe Co. of America, 1066 Home Ave., Akron 10, O.
Constad Laboratories, 85-02 162nd St., Jamaica 32, N. Y.
Construction Specialties, Inc., 55 Winans Ave., Cranford, N. J.
Consumer Products, Motor Wheel Corp., Lansing 3, Mich.
Continental Air Filters, Inc., Box 1647, Louisville 1, Ky.
Continental-Diamond Fibre Corp., Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.
Continental Equipment Co., Div. of Fisher Governor Co., Coraopolis, Pa.
Continental Machine Co., 2345 W. Nelson St., Chicago 18, Ill.
Continental Mfg. Co., P. O. Box 4048, Stansbury Rd. & B&O RR, Baltimore 22, Md.
Continental Mfg. Co., 9216 Floral Ave., Cincinnati 42, O.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Radiant Glass Heating Corp., 4 West 40th St., New York 18, N. Y.
Continental Rubber Wks., 1935 Liberty St., Erie, Pa.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
Continental Tapes, Cayce, S. C.
Contour Marker Corp., 1843 E. Compton Blvd., Compton 2, Calif.
Controlair Mfg. Co., 1932 S. Compton Ave., Los Angeles, Calif.
Control Co. of America, Soreng Div., 9555 Soreng Ave., Schiller Park, Ill.
Convector Corp., 52 Canal St., Washington, D. C.
Cook Co., Loren, 227 Depot St., Berea, O.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Coolerator Div., McGraw-Edison Co., 704 N. Clark St., Albion, Mich.
Cool-Ette, Inc., 7535 W. 8 Mile Rd., Detroit 21, Mich.
Cooley Co., E. C., 1186 Folsom St., San Francisco, Calif.
Cooper Alloy Corp., Bloy St. & Ramsey Ave., Hillside 5, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Cooper Hewitt Electric Co., Div. of Sperti-Faraday, Inc., 720-732 Grand St., Hoboken, N. J.
Copeland Refrigeration Corp., Sidney, O.
Copes-Vulcan Div., Blaw-Knox Co., 939 West 26th St., Erie 4, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 10, Mass.
Corbin Hose Clamp Div., American Hardware Corp., New Britain, Conn.
Corbman Bros., Inc., 25th & York St., Philadelphia, Pa.
Corcoran Co., R. S., P. O. Box 1404, Mound and Brandon, Joliet, Ill.
Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.
Corite Products, Inc., 6553 W. George St., Chicago 34, Ill.
Corley Co., Inc., The, 685 Myrtle Ave., Bounton, N. J.
Corning Glass Works, Corning, N. Y.
Cornish-Wire Co., Inc., 101 Water St., Williamstown, Mass.
Coroshield Co., Ltd., 250 W. 57 St., New York 19, N. Y.
Corrosion Control Co., Inc., 33 W. 42nd St., New York 36, N. Y.
Corrosite Div., Reliance Paint Co., 64 So. 6th St., Brooklyn, N. Y.
Corro-Vent, Inc., 2816 Spring Grove Ave., Cincinnati 25, O.
Coughlan Co., G. N., West Orange, N. J.
Couplings Co., 2205 W. Roosevelt Rd., Chicago 8, Ill.
Courier Associates, Inc., 570 Lexington Ave., New York, N. Y.
Cox & Co., Inc., 115 E. 23rd St., New York, N. Y.
Cox Mfg. Co., Ridgeville, Ind.
Cramer Controls Corp., Centerbrook, Conn.
Crane Associates, Robert S., 500 Hutton Place, Columbus, O.
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crane Packing Co., 6458 Oakton St., Morton Grove, Ill.
Crawford Co., 3220 W. 31st St., Chicago 23, Ill.
Crawford Fitting Co., 884 East 140th St., Cleveland 10, O.
Crescent Insulated Wire & Cable Co., Trenton 5, N. J.
Crescent Plastics, Inc., 955 Diamond Ave., Evansville, Ind.
Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
Croker Fire Protection Co., 32 W. 31st St., New York, N. Y.
Croll-Reynolds Engineering Co., Inc., 17 John St., New York 38, N. Y.
Croll & Son, Jesse G., 2326-2606 Germantown Ave., Philadelphia, Pa.
Crosby Valve & Gage Co., 43 Kendrick St., Wrentham, Mass.
Crotty Mfg. Corp., 133-15 35th Ave., Flushing, L. I., N. Y.
Crown Controls Co., Inc., 40-44 S. Washington St., New Bremen, O.
Crown Engineer Corp., Locust St., Keyport, N. J.
Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.
Cryer Trap & Valve Div., Encor Corp., 28 Joralemon St., Belleville, N. J.
Culligan Inc., Northbrook, Ill.
Cummins Portable Tools, Div. of John Oster Mfg. Co., 5055 N. Lydell Ave., Milwaukee 17, Wis.
Cuno Engineering Corp., 78 S. Vine St., Meriden, Conn.
Curtis Development & Mfg. Co., 3266 N. 33rd St., Milwaukee 16, Wis.
Curtis Mfg. Co., Refrigeration Div., 1950 Kienlen Ave., St. Louis 33, Mo.
Custanite Corp., 1228 Utica Ave., Brooklyn 3, N. Y.
Cutler-Hammer, Inc., 421 N. 12th St., Milwaukee 1, Wis.
Cyclotherm Div., National-U. S. Radiator Corp., 157 E. First St., Oswego, N. Y.

D

Dahl Co., Inc., G. W., 86 Tupelo St., Bristol, R. I.
Dalzen Mfg. Co., 4600 Bree Rd., St. Clair, Mich.
Damascus Tube Co., Greenville, Pa.
Dampney Co., The, 50 Business St., Hyde Park, Boston 36, Mass.
Dana Fan & Blower Corp., 49 Central Ave., Cincinnati 2, O.
Danielson Mfg. Co., Danielson, Conn.
Darcoid Co., Inc., 145 Sixth Ave., New York 13, N. Y.
Darling Valve & Mfg. Co., 701 First St., Williamsport, Pa.
Das Div. of The Zeller Corp., Fort Wayne Rd., Defiance, O.
Davey Compressor Co., Kent, O.
David-Ludwig Co., 14290 Goddard, Detroit 12, Mich.
Davidson Co., M. T., 7 Dey St., New York 7, N. Y.
Davidson Hyduty Roof Fan Co., 213 California St., Newton, Mass.
Davis Engineering, CA Div. of American Metal Products Co., 520 Main Ave., Wallington, N. J.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., 201 Halleck St., Newark 4, N. J.
Davis Mfg. Inc., 1301 South Handley, Wichita 13, Kans.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8, Ill.
Day Co., The, 810-830 Third Ave., N. E., Minneapolis 13, Minn.
Day & Night Mfg. Co., 855 Anaheim-Puente Rd., LaPuente, Calif.
Daystrom-Weston Sales Div., Daystrom Inc., 614 Frelinghuysen Ave., Newark 12, N. J.
Dayton Automatic Stoker Co., 1910 W. Dorothy Lane, Dayton 39, O.
Dayton Electric Mfg. Co., 126 S. Oakley Blvd., Chicago 12, Ill.
Dayton Rogers Mfg. Co., 2824 13th Ave. S., Minneapolis 7, Minn.
Dayton Rubber Co., 2342 W. Riverview Ave., Dayton 1, O.
Daytronic Corp. 216 S. Main St., Dayton 2, O.
Dean Brothers Pumps, Inc., 323 W. 10th St., Indianapolis 7, Ind.
Dean Hill Pump Co., 4000 E. 16th St., Indianapolis 7, Ind.
Deansteel Products Co., 111 Merchants St., San Antonio, Tex.
Dean Thermo-Panel Coil Div., Dean Products, Inc., 616 Franklin Ave., Brooklyn 38, N.Y.
Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.
Dearborn Stove Co., 1700 W. Commerce St., P. O. Box 5527, Dallas 2, Tex.
Debevoise Co., The, 74-84 20th St., Brooklyn 32, N. Y.
DeBothezat Fans Div., American Machine and Metals, Inc., East Moline, Ill.
Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Degree Corp., 1706 Kansas Ave., Kansas City 5, Kans.
De Laval Steam Turbine Co., 871 Nottingham Way, Trenton 2, N. J.
Delavan Mfg. Co., 811 Fourth St., West Des Moines, Ia.
Delaware Insulation Co., 5th Ave. & Colman St., Wilmington, Del.
Delco Appliance Div., General Motors Corp., P. O. Box 230, Rochester 1, N. Y.
Delco Products Div., General Motors Corp., 329 E. First St., Dayton 1, O.
Delta Welder Corp., 8525 Livernois, Detroit 4, Mich.
Deltron, Inc., 2905 Leithgow St., Philadelphia, Pa.
Deming Co., 14 Aetna St., Salem, O.
Demo-Haines Tool Corp., 2151 East Rosecrans, El Segundo, Calif.
Demuth & Sons, Inc., Charles, 245 Elm Place, Mineola, L. I., N. Y.
Denbo Engineering and Sales Co., Inc., 3301 Martindale Ave., Indianapolis.
Dennis Chemical Co., 2701 Papin, St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., 4849 W. Grand Ave., Chicago 39, Ill
Design Engineers, 214 S. Church St., Rockford, Ill.
Desmond-Stephan Mfg. Co., Urbana, O.
Desomatic Products, Inc., 1109 W. Broad St., Falls Church, Va.
d'Este Div., Kaye & MacDonald, Inc., 11-15 Central Ave., West Orange, N. J.
De-Tec-Tronic Corp., 2512 N. Halsted St., Chicago 14, Ill.
Detroit Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Detroit Deisel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Detroit Float & Stamping Co., 625 Monroe, Detroit, Mich.
Detroit Hoist & Machine Co., 8200 Morrow St., Detroit 11, Mich.
Detroit Stamping Co., 350 Midland Ave., Detroit 3, Mich.
Detroit Stoker Co., 1510 East 1st St., Monroe, Mich.
Deutsch Controls Corp., 14504 So. Figueroa, Los Angeles 61, Calif.
Devco Engineering, Inc., Control Systems Div., Pier Lane West, Caldwell Township, Caldwell, N. J.
Devcon Corp., Danvers, Mass.
Devices, Inc., A Div. of Miracle Adhesives Corp., 250 Pettit Ave. Bellmore, N. Y.
DeVilbiss Co., The, 300 Phillips Ave., Toledo 1, O.
DeVilbiss Metal Fabricators Co., 17900 Ryan Rd., Detroit 12, Mich.
Devine Mfg. Co., Inc., J. P., 49th and A.V.R.R., Pittsburgh 1, Pa
Dewey Gas Furnace Co., 101 E. Baltimore Ave., Detroit 2, Mich.
De Zurik Corp., Sartell, Minn.
Dialatemp, Inc., 706 Chestnut St., St. Louis 1, Mo.
Dialight Corp., 60 Stewart Ave., Brooklyn 37, N. Y.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J
Diamond Machine Tool Co., 5111 Coffman-Pico Rd., Pico, Calif.
Diamond Mfg. Co., 253 W. Eighth St., Wyoming, Pa.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, O.
Diamond Products, Inc., 333 Prospect St., Elyria, O.
Diamond Tool & Horseshoe Co., Duluth, Minn.
Dia-Plug Valve Corp., 1622 Fillmore Ave., Buffalo, N. Y.
Dickson Co., The, 7422 Woodlawn Ave., Chicago 19, Ill.
Diehl Mfg. Co., Finderne Plant, 1106 Finderne Ave., Somerville, N. J.
Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J
Dietz Co., Inc., Henry G., 12-16 Astoria Blvd., Long Island City 2, N. Y.
Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
Dillon & Co., Inc., W. C., 14620 Keswick St., Van Nuys, Calif.
Dillon Steam Boiler Wks., Inc., D. M., Crocker St., Fitchburg, Mass.
Dings Magnetic Separator Co., 4799 W. Electric Ave., Milwaukee 46
Distribution Equipment Div., 1601 Mercer Rd., Lexington, Ky.
Divac Div., Acme Machine Works, 13025 Cerise, Hawthorne, Calif.
Division Lead Co., 7742 W. 61st Pl., Summit, Ill.
Dixie Raydiant Electric Heat Corp., 66 Eleventh St., N. E., Atlanta 9 Ga.
Dixon Crucible Co., Joseph, Wayne & Monmouth Sts., Jersey City 3, N. J.

DoAll Co., The, 254 N. Laurel Ave., Des Plaines, Ill.
Dockson Corp., 3839 Wabash Ave., Detroit 8, Mich.
Dodge Mfg Corp., 500 S. Union St., Mishawaka, Ind.
Doerr Electric Corp., 508 N. 4th St., Cedarburg, Wis.
Dole Refrigerating Co., 5910 N. Pulaski, Chicago 46, Ill.
Dole Valve Co., The, 6201 Oakton St., Morton Grove, Ill.
Dollinger Corp., 9 Centre Park, Rochester 3, N. Y.
Domestic Mfg. Corp., 2415 McAllister, Houston 24, Tex.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Donaldson Power Ventilator Co., 2915 Knox Ave., Los Angeles 39, Calif.
Donie Engineering Sales Co., 5420 College Ave., Indianapolis 20, Ind.
Dormeyer Industries, 3418 Milwaukee Ave., Chicago 41, Ill.
Dormont Mfg. Co., 5607 Butler St.. Pittsburgh 1, Pa.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Corp., Midland, Mich.
Dowell Div. of The Dow Chemical Co., P. O. Box 536, Tulsa 1, Okla.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Wallace Ave., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Foot of 23rd St., Brooklyn 32, N. Y.
Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 2, Mich.
Drage Products, Inc., 406 32nd St., Union City, N. J.
Dravo Corp., Machinery Div., Dravo Bldg., Pittsburgh 22, Pa.
Drayer-Hanson, Division of National-U. S. Radiator Corp., Box 2215, Terminal Annex, Los Angeles 54, Calif.
Dreier Brothers Inc., 7301 Woodlawn Ave., Chicago 19, Ill.
Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., 49 Fisher Ave., Bradford, Pa.
Drew & Co., Inc., E. F., 15 E. 26th St., New York 10, N. Y.
Drico Industrial Corp., 100 8th St., Passaic, N. J.
Dryer Electric Corp., Fan Div., 164-166 Wallabout St., Brooklyn 6, N. Y
Drying Systems Co., 1812½ W. Foster Ave., Chicago 40, Ill.
Dryomatic Corp., 806 N. Fairfax St., P. O. Box 334, Alexandria, Va
Ducon Co., Inc., The, 147 E. 2nd St., Mineola, N. Y.
Dudgeon, Inc., Richard, 789 Bergen St., Brooklyn 38, N. Y.
Dunham-Bush, Inc., 179 South St., West Hartford 10, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
du Pont de Nemours & Co., E. I., Electrochemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Explosives Dept., Chemical Sales, Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington 98, Del.
du Pont de Nemours & Co., Inc., E. I., "Freon" Products Div., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington 98, Del.
du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington 98, Del.
Durabla Mfg. Co., 114 Liberty St., New York 6, N. Y.
Durable Rubber Products, 609 W. Lake St., Chicago, Ill.
Duralast Products Corp., 1601 Thalia St., New Orleans 18, La.
Durant Insulated Pipe Co., 325 Demeter St., E. Palo Alto, Calif
Durant Insulated Pipe Co., Inc., 4500 Euclid Ave., Cleveland 3, O.
Dura-Vent Corp., 2525 El Camino Real, Redwood City, Calif.
Durez Plastics Div., Hooker Chemical Corp., 1953 Walck Rd., North Tonawanda, N. Y.
Duriron Co., Inc., The, 450 N. Findlay St., Dayton 1, O.
Durkee-Atwood Co., 215 N. E. 7th St., Minneapolis, Minn.
Duro Co., The 537 E Monument Ave., Dayton 1, O
Duro-Dyne Corp., Route 110, Farmingdale, Long Island, N. Y.
Duro Metal Products Co., 2649 N. Kildare Ave., Chicago 39, Ill.
Dustender Co., 3627 Pontiac Rd., Ann Arbor, Mich.
Dust Filter Co., 134 S. La Salle St., Chicago 3, Ill.
Dust Suppression & Engineering Co., P. O. Box 67, Lake Orion, Mich.
Dustex Corp., 1758 Walden Ave., Buffalo 25, N. Y.
Dutch Brand Div., Johns-Manville Corp., 7800 S. Woodlawn Ave., Chicago 19, Ill.
DuVerre, Inc., 374 Delaware Ave., Buffalo 2, N. Y.
Dwyer Mfg. Co., F. W., P. O. Box 373, Michigan City, Ind.
Dyfoam Corp., 202 E. Cherry, Newcastle, Pa.
Dynametrics Corp., Northwest Industrial Park, Burlington, Mass.
Dynamic Air Engineering, Inc., 7412 Maie Ave., Los Angeles 1, Calif.

E

Eagan Co., Inc., Walter H., 2337 Wallace St., Philadelphia 30, Pa.
Eagle Chemical Co., Inc., Box 107, Mobile, Ala.
Eagle Copper Products Co., Inc., 600 Johnson Ave., Brooklyn, N. Y.
Eagle-Picher Co., American Bldg., Cincinnati 1, O
Earle Gear & Machine Co., 4707 Stenton Ave., Philadelphia, Pa.
Eastern Boiler Co., 524 Wethersfield Ave., Hartford 14, Conn.
Eastern Industries Inc., 100 Skiff St., Hamden 14, Conn.
Eastern Stainless Steel Corp., P. O. Box 1975, Baltimore 3, Md.
Eastman Chemical Products, Inc., Subsidiary, Eastman Kodak Co., Kingsport, Tenn.
Easton R. S. Corp., 4907 Farragut Rd., Brooklyn 3, N. Y.
Eaton Air Filter Co., 2609 E. Larned, Detroit, Mich.
Eaton Mfg. Co., Foundry Div., 700 E. Huron Ave., Vassar, Mich.
Ebco Mfg. Co., 265 N. Hamilton Rd., Columbus 13, O.
Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N. Y.
Eclipse Fuel Engineering Co., 1139 Buchanan St., Rockford, Ill.
Eco Engineering Co., 12 New York Ave., Newark 1, N. J.
Econo Products Company Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Economy Valve Seat Co., 3001 Grant St., Bellwood, Ill.
Eddington Metal Specialty Co., P. O. Box K, Eddington, Pa.
Eddy Valve Co., Waterford, N. Y.
Eder Instrument Co., 2293 N. Clybourn Ave., Chicago, Ill.
Edgewood Mfg. Co., 2215 Merced Ave., El Monte, Calif.
Edison Industries, Thomas A., Instrument Div., McGraw-Edison Co., 60 Lakeside Ave., West Orange, N. J.
Eds-Wil Burner Corp., 3737 N. Lincoln, Chicago 13, Ill.
Edward Valves, Inc., 1200 W. 145th St., East Chicago, Ind.
Edwards, L. V., 32 Irving Place, Rockville Center, N. Y.
Edwards Engineering Corp., Pompton Plains. N. J.
Eisler Engineering Co., Inc., 750 S. 13th St., Newark 3, N. J.
Ejay Baseboard Mfg. Co., 124 Boyd St., Winsted, Conn.
Elastic Porcelain Lining Corp., 221 Norris Dr., Rochester 10, N. Y.
Elcen Metal Products Co., 9325 King St., Franklin Park, Ill.
Elco Tool & Screw Corp., 1111 Samuelson Rd., Rockford, Ill.
Electrend Products Corp., 606 Water St., St. Joseph 2, Mich.
Electric Arc, Inc., 152 Jelliff Ave., Newark 8, N. J.
Electric Autolite, Toledo 1, O.
Electric Boat Div., General Dynamics Corp., Groton, Conn.
Electric Controller & Mfg. Co., Div. of Square D Co., 4526 Lee Rd., Cleveland 28, O.
Electric Furnace-Man, Inc., Emmaus, Pa.
Electric Heating & Cooling, Inc., 890-898 Broadway, Newark 4, N. J.
Electric Hose & Rubber Co., Wilmington, Del.
Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
Electric Motors & Specialties, Inc., King & Hamsher Sts., Garrett, Ind.
Electric Products Co., 1725 Clarkstone Rd., Cleveland, O.
Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore.
Electriliving Corp., 4913 College Ave., Indianapolis 5, Ind.
Electro-air Cleaner Co., Inc., Olivia & Sproul Sts., McKees Rocks, Pa
Electro-Chemical Products Corp., 16190 Saranac Rd., Cleveland 10, O.
Electro Devices, Inc., P.O. Box 156, Mt. Prospect, Ill.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Electrofilm, Inc., P. O. Box 106, North Hollywood, Calif.
Electrol Burner Mfg. Co., Inc., 22 Union Ave., Rutherford, N. J.
Electromode Div. of Commercial Controls Corp., 570 Culver Rd., Rochester 3, N. Y.
Electronics Corp. of America, 1 Memorial Dr., Cambridge 42, Mass.
Electro-Ray Mfg. Co., Inc., 8310 N. E. Highway 99, Vancouver, Wash.
Electro Rust-Proofing Corp., 30 Main St., Belleville, N. J.
Electro-Switch & Controls Inc., 5755 Camille Ave., Culver City, Calif.
Electro Temp Corp., 1.0 Maple St., Springfield 5, Mass.
Electro-Therm, Inc., 931 Selim Rd., Silver Spring, Md.
Electrovector, Inc., 475 Flushing Ave., Brooklyn 5, N. Y.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago 7, Ill.
Elgen Mfg. Co., 32-49 Gale Ave., Long Island City 1, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elgo Shutter & Mfg. Co., 2738 W. Warren Ave., Detroit 8, Mich.
Elkhart Products Corp., 1255 Oak St., Elkhart, Ind.
Elliott Co., Jeannette, Pa.
Ellicott Fabricators, Inc., Clare & Kolman Sts., Baltimore 30, Md.
Ellis & Watts Products, Inc., P. O. Box 33, Cincinnati 36, O.
Ellison Draft Gage Co., 548 W. Monroe St., Chicago, Ill.
El-Tronics, Inc., 1420 Walnut St., Philadelphia 2, Pa.
Embassy Steel Products, Inc., 890 Stanley Ave., Brooklyn 8, N. Y.
Emco Pneumatic Corp., 1317 Locust St., Des Moines, Ia.
Emerson Electric Mfg. Co., The, 8100 Florissant Ave., St. Louis 36, Mo.
Emerson Radio & Phono Corp., 14th & Coles St., Jersey City, N. J.
Emjay Maintenance Engineers, 327 Union Ave., Rutherford, N. J.
Empire Chemical Products Co., 10 Longworth St., Newark 2, N. J.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.
Enderle, Inc., Ltd., Frank X., 1715 San Fernando Rd., Los Angeles 65, Calif.
Engelhard Industries, Inc., Instruments & Systems Div., 850 Passaic Ave., East Newark, N. J.
Engelhard Industries, Inc., 113 Astor St., Newark 2, N. J.
Engesser & Co., William L., 9745 East Rush St., El Monte, Calif
Engine & Material Handling Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Engineer Co., 75 West St., New York 6, N. Y.
Engwald Corp., The, 125 Sheridan Blvd., Inwood, Long Island, N. Y.
Enjay Co., 15 W. 51st St., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., 18th & Florida Sts., San Francisco 10, Calif.
Epco Sales, Inc., 3204 Sackett Ave., Cleveland 9, O.
EPIC, Inc., 154 Nassau St., New York 38, N. Y.
Equipco, Inc., 1238 N.W Glisan, Portland 9, Ore.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 Lawrence St., N., Philadelphia 40, Pa.
Erickson Specialty Co., 10 Cayuga St., P. O. Box 141, Cohoes, N. Y.
Erie Bolt & Nut Co., Erie, Pa.
Erie City Iron Wks., 1450 East Ave., Erie, Pa.
Erie Tool Wks., 735 W. 12th St., Erie, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Ervite Corp., 4000 W. Ridge Rd., Erie, Pa.
Essex Wire Corp., 1601 Wall Street, Ft. Wayne 6, Ind.
Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif
Eutectic Welding Alloys Corp., 40-40 172 St., Flushing 58, N. Y.
Evanite Plastic Co., Div. of the Evans Pipe Co., Uhrichsville, O
Evans Corp., The George, River Drive at 37th St., Moline, Ill
Evans Machine Co., Inc., 122 S. Calverton Rd., Baltimore, Md.
Eveready Briksaw Co., 1104 Union Ave., Kansas City 1, Mo.
Everhot Heater Div., Temprite Products, Inc., Birmingham, Mich
Everite Pump & Mfg. Corp., W. Roseville Rd., Lancaster, Pa.
Everlasting Valve Co., 49 Fisk St., Jersey City 5, N. J.
Everwarm, Inc., 3600 Pleasant Ridge Road, Knoxville, Tenn.
Evis Mfg. Co., 5955 N. Rockwell St., Chicago 45, Ill.
Excelsior Leather Washer Mfg. Co., 720-730 Chestnut St., Rockford, Ill.
Excelsior Steel Furnace Co., The, 546 W. Washington Blvd., Chicago

Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
Exit-Aire Co., 13650 Vaughn St., Pacoima, Calif.
Extraer, Inc., 1210 Chenevert, Houston, Tex.
Extremultus, Inc., 25-11 40 Ave., Long Island City 1, N. Y.
Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

F

F 5 Air Conditioning Corp., 1815 S. Maybelle, Box 9355, Tulsa, Okla.
Faber Engineering Co., Inc., 240 W. Washington St., Norristown, Pa.
Fabreeka Products Co., Inc., 1190 Adams St., Boston 24, Mass.
Fabri-Valve Co. of America, 2100 N. Albina, Portland, Ore.
Fafnir Bearing Co., The, 37 Booth St., New Britain, Conn.
Fairbanks Co., The, 393 Lafayette St., New York 3, N. Y.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairchild Camera & Instrument Corp. of Syosset, Long Island, N. Y.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmount Tool & Forging, Inc., 10611 Quincy Ave., Cleveland 6, O.
Falcon Equipment Co., 13th St., New Brighton, Pa.
Falk Corp., 3010 W. Canal St., Milwaukee 1, Wis.
Falls Industries, Inc., 31915 Aurora Rd., Solon, O.
Falstrom Co., 26 Falstrom Court, Passaic, N. J.
Famco Machine Co., 3114 Sheridan Rd., Kenosha, Wis.
Fanner Mfg. Co., The, Brookside Park, Cleveland 9, O.
Farr Company, P. O. Box 90187, Airport Station, Los Angeles 45, Calif.
Farrell Associates, Charles, Valencia, Pa.
Farris Engineering Corp., 405 Commercial Ave., Palisades Park, N J
Farris Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N. J.
Fasco Industries, Inc., P. O. Box 509, Rochester 2, N. Y.
Fastening Devices, Inc., 369 50th St., Brooklyn, N. Y.
Fastway Fasteners, Inc., 1676 East 28th St., Lorain, O
Fedders Corp., Heating Div., P. O. Box 1690, Trenton 7, N. J.
Fedders Corp., 57 Tonawanda St., Buffalo 7, N. Y.
Federal Boiler Co., Inc., Granite and West Sts., Midland Park, N. J.
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., 11031 Shoemaker St., Detroit 13, Mich.
Federal Pump Corp., 1144 Utica Ave., Brooklyn 3, N. Y.
Federal Seaboard Terra Cotta Corp., 10 E. 40th St., New York 16, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Felt Products Mfg. Co., 7450 No. McCormick Blvd., Skokie, Ill.
Felters Company, The, 210 South St., Boston 11, Mass.
Fenwal Inc., Pleasant St., Ashland, Mass.
Fenway Machine Co., 3107 N. Broad St., Philadelphia 32, Pa.
Fern, Ralph, 1007 Fisk St., Scranton 9, Pa.
Ferro Corp., 4150 East 56th St., Cleveland 5, O.
Fibercast Co., P. O. Box 727, Sand Spring, Okla.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fiese & Firstenberger Mfg., Inc., 2494 Railroad Ave., Fresno, Calif.
Filt-R-Ite Co., 1408 W. Harrison St., Chicago 7, Ill.
Filtrine Mfg. Co., Inc., 63 Wanamaker Ave., Waldwick, N. J.
Fine Products Co., 6240 Ogden, Berwyn, Ill.
Finn & Company, Inc., T. R., 200 Central Ave., Hawthorne, N. J.
Finnigan & Co., Inc., J. J., 722 Marietta, N. W., Atlanta 18, Ga.
Fischer & Porter Co., 600 Warminster Rd., Hatboro, Pa.
Fisher Governor Co., P. O. Box 307, Marshalltown, Ia.
Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.
Flagg & Co., Inc., Stanley G., #3 Penn Center Plaza, Philadelphia 2, Pa.
Flanders Filters, Inc., P. O. Box 718, Riverhead, Long Island, N. Y.
Flemm Lead Co., Inc., Bradley Ave. & School St., Long Island City, 1, N. Y.
Flexaust Co., 100 Park Ave., New York 17, N. Y.
Flexible Metal Hose Mfg. Co., 777 West 16th St., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexo Supply Co., Inc., 4649 Page Blvd., St. Louis 13, Mo.
Flexonics Corp., 1391 S. Third Ave., Maywood, Ill.
Flexrock Co., 36 & Filbert Sts., Philadelphia 4, Pa.
Flintkote Co., The, 30 Rockefeller Plaza, New York 20, N. Y.
Flodar Corp., 16911 St. Clair, Cleveland 10, O.
Flood Co., Hudson, O.
Floridin Co., P. O. Box 989, Tallahassee, Fla.
Flow Corp., 85 Mystic St., Arlington 74, Mass.
Flowline Corp., New Castle, Pa.
Fluid Systems, Inc., 1881 Dixwell Ave., New Haven 14, Conn.
Fluor Products Co., P. O. Box 1267, Santa Rosa, Calif.
Fluxolder Products Co., 438 E. Woodbridge St., Detroit 26, Mich.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2, Md.
Flynn Mfg. Co., Michael, 700 East Godfrey Ave., Philadelphia 24, Pa.
Foamade Industries, 14851 - 11 Mile Rd., Oak Park 37, Mich.
Forest-Wool Insulation Co., Inc., 215 No. Linden, Marshall, Mich.
Formica Corp., The, 4614 Spring Ave., Cincinnati, O.
Forney Engineering Co., 2705 Hawes St., Dallas 9, Tex.
Ft. Worth Steel & Machinery Co., P. O. Box 1038, Ft. Worth, Tex.
Forty-Eight Insulations, Inc., P. O. Box 472, Aurora, Ill.
Foster Co., Benjamin, 4636 W. Girard Ave., Philadelphia 31, Pa.
Foster Engineering Div., General Controls Co., Warwick Industrial Park, Warwick, R. I.
Foster Pump Wks., Inc., 46-A Washington St., Brooklyn 1, N. Y.
Foster Wheeler Corp., 666 Fifth Ave., New York 19, N. Y.
Fostoria Corp., Buck & County Line Rds., Huntingdon Valley, Pa.
Foxboro Co., 106 Neponset Ave., Foxboro, Mass.
Fram Corp., Providence 16, R. I.
France Refractories Co., J. H., 1921 France Rd., Snow Shoe, Pa.
Frankell Mfg. Co., 862 Newark Ave., Jersey City 6, N. J.
Franklin Balmar Corp., Woodberry, Baltimore 11, Md.
Franklin Dales Co., 180-184 E. Mill St., Akron 8, O.
Franklin Electric Co., Inc., 400 E. Spring St., Bluffton, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Fraser & Johnston Co., 1900 17th St., San Francisco, Calif.
Frasse & Co., Inc., Peter A., 17 Grand St., New York 13, N. Y.
Frederick Iron & Steel Inc., E. 7th St., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Fresh'nd-Aire Co., Div. of Cory Corp., 3200 W. Peterson, Chicago, Ill.
Fretz-Moon Tube Co., Inc., P. O. Box 551, Butler, Pa.
Frick Co., Waynesboro, Pa.
Fricke, Fred J., 4404 Avenida Estrellita, Albuquerque, N. M.
Friedrich Refrigerators, Inc., 1117 E. Commerce, San Antonio, Tex.
Friermood Machine Works, Converse, Ind.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave., Towson Baltimore 4, Md.
Frigid, Inc., 128 32nd St., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton 1, O.
Frigid Coil, Inc., 9860 Rush St., El Monte, Calif.
Frigikar Corp., 10858 Harry Hines Blvd., Dallas, Tex.
Frontier Bronze Corp., Packard Rd., Niagara Falls, N. Y.
Fuelguard Co., 5643 Dyer St., Dallas 6, Tex.
Fuel Watchman, 77-29 138th St., Flushing 67, N. Y.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Fuller Co., 124 Bridge St., Catasauqua, Pa.
Fuller Co., D. William, 2320 E. 75th St., Chicago 49, Ill.
Fuller Co., H. B., 255 Eagle St., St. Paul 2, Minn.
Fuller Co. of Calif., H. B., 57 So. Linden Ave., S. San Francisco, Calif.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Box 400, Knoxville 1, Tenn.
Furnas Electric Co., 1041 McKee St., Batavia, Ill.
Fyr-Fyter Co., 221 Crane St., Dayton 1, O.

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G. M. Mfg. Co., 134 W. 26th St., New York, N. Y.
G & O Mfg. Co., 138 Winchester Ave., New Haven 8, Conn.
GPE Controls, Inc., 240 E. Ontario St., Chicago 11, Ill.
Gabriel Boiler Co., 1428 N.W. 14th Ave., Portland, Ore
Gaffers & Sattler, 8111 W. Beverly Blvd., Los Angeles 48, Calif.
Gallaher Co., The, 4108 Dodge St., Omaha 3, Neb.
Galloway Co., G. W., 220 So. First Ave., Arcadia, Calif.
Gamon Meter Div., Worthington Corp., 296 South St., Newark, N. J.
Gannon Co., Russell R., 5535 Vine St., Cincinnati 16, O.
Garden City Fan Co., 801 N. Eighth St., Niles, Mich
Garden City Instruments, Inc., 931 Sherman Ave., Evanston, Ill.
Gardiner Electronics Co., 2545 E. Indian School Rd., Phoenix, Ariz.
Gardiner Metal Co., 4820 So. Campbell Ave., Chicago 32, Ill.
Gardner-Denver Co., Quincy, Ill.
Garlock Packing Co., The, 402 Main St., Palmyra, N. Y.
Garman Co., Inc., The, 1253 Grover Rd., St. Louis 25, Mo.
Gas Machinery Co., 16100 Waterloo Rd., Cleveland 10, O.
Gas & Oil Industry Laboratories, Inc., 4 Paine Ave., Irvington, N. J
Gasoilair Equipment Co., P. O. Box 768, New Haven, Conn.
Gates Engineering Co., 100 S. West St., Wilmington 99, Del.
Gates Rubber Co., The, 999 S. Broadway, Denver 17, Colo.
Gateway Engineering Co., 3233 W. Grand Ave., Chicago, Ill.
Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
Gato Valve Co., 912-916 Behan St., Pittsburgh 33, Pa.
Gavitt Wire & Cable Co., Div. of Amerace Corp., 100 Central St., Brookfield, Mass.
Gelber & Sons, Inc., S., 5806 N. Lincoln Ave., Chicago 45, Ill.
Gelman Instrument Co., 106 N. Main, Chelsea, Mich.
Gel-Me Co., P. O. Box 293, Bloomington, Ill.
Gem Clay Forming Co., P. O. Box 500, Sebring, O.
Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif.
General Air Conditioning Corp., 4542 E. Dunham St., Los Angeles.
General Air Products Corp., 14-40 Factory St., Cedar Grove, N. J.
General Alliance Corp., 2105 Moore St., San Diego 1, Calif.
General Aluminum Supply Co., 1506 Eastern Ave., Kansas City 26, Mo.
General-American Valve Co., P. O. Box 444, Corona Del Mar, Calif.
General Automatic Products Corp., 2300 Sinclair Lane, Baltimore 13, Md.
General Blower Co., Subsid. Ilg Electric Ventilating Co., 8610 Ferris Ave., Morton Grove, Ill.
General Blower Co., 6412 Girard Ave., Philadelphia 31, Pa.
General Ceramics Corp., Crows Mill Road, Keasbey, N. J.
General Chemical Div., Allied Chemical Corp., 40 Rector St., New York, N. Y.
General Controls Co., 801 Allen Ave., Glendale 1, Calif. and Skokie, Ill.
General Dynamics Corp., Liquid Carbonic Div., 135 S. LaSalle St., Chicago 3, Ill.
General Electric Co., One Progress Rd., Shelbyville, Ind.
General Electric Co., Air Conditioning Dept., Tyler, Texas.
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.
General Electric Co., Appliance Control Dept., Morrison, Ill.
General Electric Co., Capacitor Dept., Ft. Edward, N. Y.
General Electric Co., Chemical Materials Dept., 1 Plastics Ave., Pittsfield, Mass.
General Electric Co., Construction Materials Sales Operation, 1285 Boston Ave., Bridgeport 2, Conn.
General Electric Co., Laminated Products Dept., Coshocton, O.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland 12, O.
General Electric Co., Major Appliance Div., Air Conditioning Dept., Appliance Park, Louisville 1, Ky.

General Electric Co., Small Steam Turbine Dept., 166 Broad St., Fitchburg, Mass.
General Electric Co., Wiring Device Dept., 95 Hathaway St., Providence 7, R. I.
General Electric Co., X-Ray Dept., 4855 W. Electric Ave., Milwaukee Wis.
General Filter Co., 923 Second St., Ames, Ia.
General Filters, Inc., 43800 Grand River, Novi, Mich.
General Fittings Co., P. O. Box 151, East Greenwich, R. I.
General Heating Products Co., 7426 State Rd., Philadelphia 36, Pa.
General Machine & Mfg. Co., Blair St. & Spring Garden Ave., Berwick, Pa.
General Metals, Inc., 858 Goldsboro St., P. O. Box 448, Greensboro N. C.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Products Co., Inc., Fredericksburg, Va.
General Rubber Corp., Summit & Atwood St., Tenafly, N. J.
General Scientific Equipment Co., Limekiln Pike & Williams Ave., Philadelphia 50, Pa.
General Sound Control, Inc., 11810 Center St., Hollydale, Calif.
General Tire & Rubber Co., 444 Tacoma Ave., Logansport, Ind.
General Tire & Rubber Co., 1708 Englewood, Akron, O.
General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
Geneva Mfg. Co., N. Woodbury Rd., South Elgin, Ill.
Genie-Air, 4273 S. Broadway, Los Angeles, Calif.
Geo-Drill Co., P. O. Box No. 6, Bridgeville, Pa.
Gerett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Germatrol Corp., 7025 Chaucer St., Pittsburgh 8, Pa.
Gerrard & Co., A. J., 1950 Hawthorne Ave., Melrose Park, Ill.
Gerry Tool Co., 135 Terryville Rd., Bristol, Conn.
Giannini & Co., Inc., G. M., 918 E. Green St., Pasadena, Calif.
Giant Mfg. Co., 6th St. & 12th Ave., Council Bluffs, Ia.
Gibraltar Corp. of America, 223 N. 9th St., Brooklyn, N. Y.
Gibson-Homans Co., 2366 Woodhill Rd., Cleveland 6, O.
Gibson Refrigerator Co., Greenville, Mich.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert Brass Foundry Co., 5028 Farlin St., St. Louis, Mo.
Gilbreth Co., The, 1211 Chestnut St., Philadelphia 7, Pa.
Gisholt Machine Co., 1253 E. Washington Ave., Madison 10, Wis.
Glidden Co., The, 900 Union Commerce Blvd., Cleveland 14, O.
Glidden Co., Nubian Div., 1857 N. LeClaire, Chicago 39, Ill.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Globe Products, Huppower Div., Hupp Corp., 7450 Melville Ave., Detroit 17, Mich.
Glo-Brite Products, Inc., 6415 N. California Ave., Chicago 45, Ill.
Goder, Inc., Joseph, 4241 N. Honore St., Chicago 13, Ill.
Goder Incinerator Corp., 13920 S. Western Ave., Blue Island, Ill.
Goethel Sheet Metal Wks., Inc., Alfred, 3218 W. Fond du Lac Ave., Milwaukee 10, Wis.
Gold Top Heating, Inc., 330 Del Mar Pl., P. O. Box 2, San Gabriel, Calif.
Golden Anderson Valve Specialty Co., 1232 Ridge Ave., Pittsburgh 33.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodall Rubber Co., 441 Whitehead Rd., Trenton, N. J.
Goodfellow Co., Inc., E. D., 496 E. Bodley Ave., Memphis, Tenn.
Goodrich Co., B. F., Shelton, Conn.
Goodrich Chemical Co., B. F., 3135 Euclid Ave., Cleveland 15, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Koroseal Div., Marietta, O.
Goodyear Pumps, Inc., 9 Rockefeller Plaza, New York, N. Y.
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, O.
Goodwill Mfg. Co., 1213 S. Laramie, Chicago 50, Ill.
Gordon & Piatt, Inc., P. O. Box 914, Winfield, Kan.
Gorman-Rupp Co., 305 Bowman St., Mansfield, O.
Gorton Heating Corp., Cranford, N. J.
Goss Gas Inc., P. O. Box 57, Glenshaw, Pa.
Gotham Refining Chemical Co., 475 Fifth Ave., New York 17, N. Y.
Gould Co., J. D., 4707 Massachusetts Ave., Indianapolis 18, Ind.
Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
Governair Corp., 4840 North Sewell, Oklahoma City 4, Okla.
Governale Bros., Inc., 5518 Ave., N., Brooklyn, N. Y.
Grabler Mfg. Co., 6565 Broadway, Cleveland 5, O.
Grace & Co., W. R., Davison Chemical Div., 101 N. Charles St., Baltimore 3, Md.
Graham Mfg. Co., Inc., 170 Great Neck Rd., Great Neck, Long Island, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Granberg Corp., 1308 67th St., Oakland 8, Calif.
Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
Grant Wilson, Inc., 141 W. Jackson Blvd., Suite 1560, Chicago, Ill.
Graphic Calculator Co., 633 Plymouth Ct., Chicago 5, Ill.
Graphic Indicator Co., 1739 S. La Cienega Blvd., Los Angeles 35, Calif.
Graton & Knight Co., 356 Franklin St., Worcester 4, Mass.
Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.
Gray Co., Inc., 56 - 11th Ave., N. E., Minneapolis 13, Minn.
Gray Pantograph Engraving Co., 200 Washington St., Hoboken, N. J.
Gray Tool Co., P. O. Box 2291, Houston, Tex.
Great Northern Mfg. Corp., 1056 N. Wood St., Chicago 22, Ill.
Great Western Steel Co., 2300 West 58th, Chicago 36, Ill.
Green Fire Brick Co., A. P., Mexico, Mo.
Green Fuel Economizer Co., Inc., The, 780 Main St., Beacon, N. Y.
Green Instrument Co., Inc., 385 Putnam Ave., Cambridge 39, Mass.
Green Instruments, Inc., Henry J., 2500 Shames Dr., Westbury, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Greenfield Tap & Die Div. of United Greenfield Corp., Sanderson St., Greenfield, Mass.
Greenheck Fan & Ventilator Corp., Schofield, Wis.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., 2136 12th St., Rockford, Ill.
Greenville Tubes, Inc., P. O. Box 30, Greenville, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., 1101 Meridian Ave., Alhambra, Calif.
Greer Hydraulics, Inc., N. Y. International Airport, Jamaica 30, N
Gregory Industries, Inc., Bulldog Div., 102-10 Toledo Ave., Lorain, O.
Gregory Industries, Inc., Nelson Stud Welding Div., Lorain, O.
Griffin & Co., 500 Bergman Ave., Louisville 8, Ky.
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.
Griphoist, Inc., 744 Harrison St., San Francisco 7, Calif.
Grip Nut Co., South Whitley, Ind.
Griscom-Russell Co., The, Massillon, O.
Gross-Aire Mfg. Co., 9416 W. Milton Ave., Overland 14, Mo.
Grove Valve and Regulator Co., 65th & Hollis St., Oakland, Calif.
Guard Coatings Corp., 8-05 43rd Ave., Long Island City 1, N. Y.
Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.
Guardian Products Corp., 1215 E. 2nd St., Michigan City, Ind.
Gulf Oil Corp., P. O. Box 1166, Gulf Bldg., Pittsburgh 30, Pa.
Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City 6, Mo.

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H. A. Mfg. Co., 1612 W. King St., York, Pa.
H-B Instrument Co., American & Bristol Sts., Philadelphia 40, Pa.
H & H Tube & Mfg. Co., 245-275 N. Forman Ave., Detroit 17, Mich.
H & M Pipe Beveling Machine Co., 311 East 3rd, Tulsa, Okla.
H-P Products, Inc., 514 W. Gorgas St., Louisville, O.
Hadley Products Co., Inc., Marietta, O.
Haertel Co., Walter, 2840 4th Ave., S., Minneapolis 8, Minn.
Hagan Chemicals & Controls, Inc., Rt. 60 at Campbell's Run Rd., P. O. Box 1346, Pittsburgh 30, Pa.
Hager & Son, Inc., 510 Buckbee St., Rockford, Ill.
Hague & Co., Inc., Alfred, Div. of Lacquer & Chemical Corp., 21 40th St., Brooklyn 32, N. Y.
Haines & Co., Inc., Wm. S., Div. Sellers Injector Corp., 1600 Hamilton St., Philadelphia 30, Pa.
Hall Co., P. O. Box 425, Windsor Locks, Conn.
Hall Laboratories, Hagan Bldg., Pittsburgh 30, Pa.
Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.
Hamburg Boiler Wks., Inc., Grand St., Hamburg, Pa.
Hamer-Dril Co., 512 Greenwich St., New York 13, N. Y.
Hamer Valves Inc., 2919 Gardenia Ave., Box 1851, Long Beach 1, Calif.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Hamilton Fan & Blower Co., Inc., 2650 Colerin Ave., Cincinnati, O.
Hamilton Kent Mfg. Co., 427 West Grant St., Kent, O.
Hamilton Rubber Mfg. Corp., Meade St., Trenton 3, N. J.
Hamlin Co., Inc., J. F., 746 Ellis St., San Francisco 9, Calif.
Hammel-Dahl Div., General Controls Co., Warwick Industrial Park, Warwick, R. I.
Hammett Co., 2311 Tauromee Ave., Kansas City 2, Kans.
Hammond Machinery Builders, Inc., 1600 Douglas, Kalamazoo, Mich.
Hammond Valve Corp., 1844 Summer Blvd., Hammond, Ind.
Hampton-Cross Co., The, 120 S. 10th St., Louisville 2, Ky.
Handy Angle Div., The Lugall Co., Haverford, Pa.
Handy & Harman, 82 Fulton St., New York 38, N. Y.
Haney Burner Div., Southwest Gas Corp., Box 271, Las Vegas, Nev.
Hankison Corp., College & Pike, Canonsburg, Pa.
Hanna Engineering Wks., 1767 N. Elston, Chicago 22, Ill.
Hannifin Corp., 501 S. Wolf, DesPlaines, Ill.
Hanovia Lamp Div., Engelhard Industries, Inc., 100 Chestnut St., Newark 5, N. J.
Hansen Mfg. Co., Inc., Princeton 15, Ind.
Hanson Equipment Co., 301 Charles St., Beloit, Wis.
Hansson, Inc., Elof, Acoustical Div., 711 3rd Ave., New York 17, N
Harco Corp., Cathodic Protection Div., 4600 E. 71st St., Cleveland 25.
Hardinge Oil Burner & Mfg. Co., 1770 Berteau St., Chicago 13, Ill.
Harman Equipment Co., 3605 East Olympic Blvd., Los Angeles 23, Calif.
Harmond Company, 2114 Woodlawn, Cleveland 2, O.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.
Harold Electric Co., 210 E. Alder, Walla Walla, Wash.
Harper Co., H. M., 8388 Lehigh Ave., Morton Grove, Ill.
Harrington & King Perforating Co., Inc., 5655 Fillmore St., Chicago 44, Ill.
Harris Calorific Co., The, 5501 Cass Ave., N. W., Cleveland 2, O.
Harris & Co., Arthur, 210 N. Aberdeen St., Chicago 7, Ill.
Harrisburg Steel Co., Div. of Harsco Corp., 10th & Herr Sts., Harrisburg, Pa.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Harrison Sheet Steel Co., 4718 W. 5th St., Chicago 44, Ill.
Harrison Steel Corp., 200 Greenpoint Ave., Brooklyn 22, N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Hart Mfg. Co., The, 116 Bartholomew Ave., Hartford 1, Conn.
Hartmann Co., Chas., 985 Dean St., Brooklyn 38, N. Y.
Hartzell Propeller Fan Co., P. O. Box 909, Roosevelt Ave., Piqua, O.
Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.
Haskel Engineering & Supply Co., 1236 S. Central Ave., Glendale, Calif.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Hastings Air Control, Inc., 3215 Leavenworth St., Omaha, Nebr.
Hastings-Raydist, Inc., Hampton, Va.
Hauck Mfg. Co., 126-136 10th St., Brooklyn 15, N. Y.
Haveg Industries, Inc., 900 Greenbank Rd., Wilmington 8, Del.
Havens Cooling Tower, Div. of Havens Structural Steel Co., 1713 Crystal Ave., Kansas City, Mo.
Haydon Co., A. W., The, 258 N. Elm, Waterbury, Conn.
Haydon Div., General Time Corp., 245 E. Elm St., Torrington, Conn.
Hayes Furnace Mfg. & Supply Co., 3233 South LaCienega Blvd., Los Angeles 16, Calif.
Haynes Stellite Co., Div. of Union Carbide Corp., 420 Lexington Ave., New York 17, N. Y.

Hays Corp., The, 800 E. 8th St., Michigan City 14, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Healey Co., Lee, 554 W. Garfield, Glendale 4, Calif.
Healy Ruff Co., 2257 University Ave., St. Paul 14, Minn.
Heat-Exchangers, Inc., 2003 W. Fulton St., Chicago, Ill.
Heatmore, Inc., 651-5 Driggs Ave., Brooklyn 11, N. Y.
Heat & Power Corp., 424 E. Saratoga St., Baltimore 2, Md.
Heat-Timer Corp., 657 Broadway, New York 12, N. Y.
Heat Transfer Products, Inc., Park Ave., Perkasie, Pa.
Heat Transmission Conduit Co., 2300 Payne Ave., Rm. 503, Cleveland 14, O.
Heatron, Inc., 333 Eberts Lane, York, Pa.
Heatube Dept., Coolerator Div., McGraw-Edison Co., Albion, Mich.
Heat-X, Inc., Subsidiary of Dunham-Bush, Inc., Brewster, N. Y.
Heating Assurance, Inc., 124 E. Augusta St., Spokane 21, Wash.
Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11.
Hein-Werner Corp., 1200 National Ave., Waukesha, Wis.
Heinemann Electric Co., 497 Plum St., Trenton 2, N. J.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.
Heller Laboratories, Inc., 124 Fort Lee Rd., Leonia, N. J.
Helmco, Inc., 7400 W. Lawrence Ave., Chicago 31, Ill.
Henderer's Sons, A. L., 689 Maryland Ave., Wilmington 99, Del.
Hendley & Whittemore, 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry Furnace Co., The, Medina, O.
Henry Valve Co., 3215 North Ave., Melrose Park, Ill.
Henszey Co., 202½ N. Water St., Watertown, Wis.
Herbusch Corp., The, 706 Chestnut St., 210 Title Guaranty Bldg., St. Louis 1, Mo.
Hercules Chemical Co., Inc., 416 Broadway, New York 13, N. Y.
Hercules Powder Co., Wilmington, Del.
Hercules Power Equipment Co., P. O. Box 49724, Barrington Station, Los Angeles 49, Calif.
Heresite & Chemical Co., Manitowoc, Wis.
Herman Nelson Products, American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.
Herman, Shepard, P. O. Box 23, Newton Upper Falls, Mass.
HERRmidifier Co., 1810 Hempstead Rd., Lancaster, Pa.
Hersey-Sparling Meter Co., 250 Elm St., Dedham, Mass.
Hershey Motorstokor, Manheim, Pa.
Hertner Electric Co., The, 12690 Elmwood Ave., Cleveland 11, O.
Hetherington & Berner Inc., 747 Kentucky Ave., Indianapolis 7, Ind.
Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.
Hexdall Co., A. M., Morris, Ill.
Highside Chemicals, Inc., 10-14 Colfax Ave., Clifton, N. J.
Hi-Grade Alloy Corp., 3034 E. 95th St., Chicago 17, Ill.
Hill & Co., E. Vernon, P. O. Box 189, Lake Geneva, Wis.
Hill, Hubbell & Co., 3091 Mayfield Rd., Cleveland 18, O.
Hill, Inc., Walter P., 22183 Telegraph Rd., Detroit 19, Mich.
Hill Pump Valve Co., 2728 N. Elston Ave., Chicago, Ill.
Hilliard Corp., 100 W. 4th St., Elmira, N. Y.
Hills-McCanna Co., 4600 W. Touhy Ave., Chicago 46, Ill.
Hi-Lo Mfg. Co., 2853 Columbus Ave., Minneapolis, Minn.
Hilo Varnish Corp., Div. of Carpenter-Morton Co., 376 Third St., Everett 49, Mass.
Hilti Rapid Fastening Systems, Inc., 73 Southfield Ave., Stamford, Conn.
Hinde & Dauch Div., West Virginia Pulp & Paper Co., P. O. Box 861, Sandusky, O.
Hindle Transformer Co., Inc., Woods Church Rd., Flemington, N. J.
Hirschman-Pohle Co., Inc., 12 Lent Ave., LeRoy, N. Y.
Hite Mfg. Co., N. E., 303 North Elizabeth St., Chicago 7, Ill.
Hobart Bros. Co., Hobart Square, Troy 1, O.
Hodge Boiler Wks., 99-111 Sumner St., East Boston 28, Mass.
Hodgman Mfg. Co., Inc., 135 Washington St., Taunton, Mass.
Hoff Mfg. Co., Johnson Rd., Bethany, New Haven 15, Conn.
Hoffacker Machine Tool Co., 1140 Pontiac Ave., Cranston 10, R. I.
Hoffman Combustion Engrg. Co., 1780 Southfield Rd., Lincoln Park, Mich.
Hoffman Specialty Mfg. Corp., 1700 W. 10th St.. Indianapolis 7, Ind.
Hofmann Engineering Co., 4022 W. 55th St., Chicago 32, Ill.
Hogart Engineering Co., 1050 S. Olive St., Los Angeles, Calif.
Hohman & Bernard Inc., 204 E. 33rd St., New York, N. Y.
Holby Tempering Valve Co., Inc., 1146 Second Ave., New York 21.
Hollaender Mfg. Co., 3841 Spring Grove Ave., Cincinnati 23, O.
Hollands Mfg. Co., Erie, Pa.
Holsclaw Bros., Inc., 408 N. Willow Rd., Evansville 11, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., 125 Armory St., Boston 19, Mass.
Holub Industries, Inc., Sycamore, Ill.
Homestead Valve Mfg. Co., P. O. Box 348, Coraopolis, Pa.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
Hoppes Mfg. Co., Inc., 301 N. Greenmount Ave., Springfield, O.
Horn Companies, A.C., Subsidiary of Sun Chemical Corp., 750 3rd Ave., New York 17, N. Y.
Horton Mfg. Co., 1179 15th Ave., Minneapolis 14, Minn.
Hose Accessories Co., 2700 No. 17th St., Philadelphia 32, Pa.
Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotpoint, 5600 W. Taylor St., Chicago 44, Ill.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4, O.
Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
Howard Industries, Inc., Racine, Wis.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago 18, Ill.
Howell Electric Motors Co., Howell, Mich.
Howes-Woods Co., 201 Bridge St., Cambridge, Mass.
Hubbell Corp., P. O. Box 700, Hawley Rd., Mundelein, Ill.
Huck Mfg. Co., 2480 Bellvue, Detroit, Mich.
Hudson Engineering Corp., P. O. Box 6158, Houston 6, Tex.
Hudson Industries, Inc., 4400 St. Aubin Ave., Detroit 7, Mich.
Hudson Mfg. Co., H. D., 589 E. Illinois St., Chicago 11, Ill.
Humboldt Mfg. Co., 2016 N. Whipple St., Chicago, Ill.
Humidaire Corp., 313 W. Main St., Genoa, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Hunt Spiller Mfg. Corp., 383 Dorchester Ave., Boston, Mass.
Hunt Valve Co., 1913 E. State St., Salem, O.
Hunter Div., Robbins & Myers, Inc., 2500 Frisco Ave., Memphis, Tenn.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa.
Hussey & Co., C. G., Div. of Copper Range Co., 2850 Second Ave., Pittsburgh 19. Pa.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8, Pa.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Hydrauger Corp., Ltd., 681 Market St., San Francisco 5, Calif.
Hydraulic Mfg. Co., 138 Hurd Ave., Bridgeport 4, Conn.
Hydromation Corp., 900 W. Erie St., Chicago 22, Ill.
Hydronic Co., The, 12685 Arnold Ave., Detroit 39, Mich.
Hydropump, Inc., 165 S. Fair Oaks Ave., Pasadena, Calif.
Hydrotherm, Inc., Clinton Ave., Northvale, N. J.
Hydrozion Engineering Co., Inc., 2003 Indiana Ave., Kansas City 27, Mo.
Hynes Electric Heating Div., Turbine Equipment Co., P. O. Box 578, Westfield, N. J.

I

I.C.E.D., Inc., 579 27th St., So., P. O. Box 10515, St. Petersburg, Fla.
I-T-E Circuit Breaker Co., 1900 Hamilton St., Philadelphia 39, Pa.
I. W. Air Conditioning Corp., 230 Manida St., New York 59, N. Y.
Ideal Corp., 435 Liberty Ave., Brooklyn 7, N. Y.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Industries, Inc., 1096 Parke Ave., Sycamore, Ill.
Ilg Electric Ventilating Co., 2841 N. Pulaski Rd., Chicago 41, Ill.
Illinois Bronze Powder Co., 2015 S. Clark St., Chicago 16, Ill.
Illinois Engineering Products, American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.
Illinois Malleable Iron Co., 1701 Wellington, Chicago 13, Ill.
Illinois Oil Products, Inc., Illinois Oil Bldg., 4th Ave. and 24th St., Rock Island, Ill.
Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago 10.
Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.
Illinois Zinc Co., Div. of Hydrometals, Inc., 2959 W. 47th St., Chicago 32, Ill.
IMC Magnetics Corp., 570 Main St., Westbury, Long Island, N. Y.
Imeco, Inc., 3033 W. Belmont Ave., Chicago 18, Ill.
Imperial Brass Mfg. Co., 6300 W. Howard St., Chicago 48, Ill.
Imperial Chemicals Corp., 6505 Wilshire Blvd., Los Angeles 48, Calif.
Imperial Damper Co., 664 Edgecombe Ave., New York 32, N. Y.
Imperial Electric Co., 64 Ira Ave., Akron, O.
Imperial Oil & Grease Co., Inc., 6505 Wilshire Blvd., Los Angeles 48.
Incinerator Products Co., 633 S. Post Ave., Detroit 17, Mich.
Independent Blade Corp., P. O. Box 1482, Joliet, Ill.
Independent Register Co., 3747 E. 93rd St., Cleveland 5, O.
Indus Corp., 1815 Madison Ave., Indianapolis 25, Ind.
Industrial Acoustics Co., Inc., 341 Jackson Ave., New York 54, N. Y.
Industrial Balancing Engrs. Div., Calkins Machine & Tool Wks., East Main, E. Aurora, N. Y.
Industrial Combustion, Inc., 4507 N. Oakland Ave., Milwaukee, Wis.
Industrial Development Laboratories, Inc., Edgewater, N. J.
Industrial Engineering Corp., 525 E. Woodbine, Louisville, Ky.
Industrial Engineering & Equipment Co., 24 Hanley Industrial Ct., St. Louis (Brentwood), Mo.
Industrial Filter & Pump Co., 5900 W. Ogden Ave., Cicero, Ill.
Industrial Finishes Co., Inc., 1119 Land Title Bldg., Broad & Chestnut Sts., Philadelphia 10, Pa.
Industrial Laminates Div., Fabric Distributing Co., 42 White St., New York 13, N. Y.
Industrial Marketers, 2505 Pinecrest, Ferndale 20, Mich.
Industrial Metal Protectives, Inc., 401 Homestead Ave., Dayton 8, O.
Industrial Plastic Fabricators, Endicott St., Norwood, Mass.
Industrial Plastics Fittings Co., 11 West Pennsylvania Ave., Towson, Md.
Industrial Products Co., 2666 N. Fourth St., Philadelphia 33, Pa.
Industrial Products Div., Perfex Corp., 500 West Oklahoma Ave., Milwaukee 7, Wis.
Industrial Screw Co., 4920 W. Madison, Chicago 44, Ill.
Industrial Sheet Metal Work, 3155 N. Halsted St., Chicago 14, Ill.
Industrial Sound Control, Dept. of Koppers Co., Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Industrial Tape Div., Hampton Mfg. Co., 111 Cedar St., New Rochelle, N. Y.
Industrial Tubular Equipment Co., 12906 Saticoy St., North Hollywood, Calif.
Infilco, Inc., P. O. Box 5033, Tucson, Ariz.
Infra Insulation Inc., Western Highway, West Nyack, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Ingersoll Steel Div., Borg-Warner Corp., 200 S. Michigan Ave., Chicago 4, Ill.
Inland Heater Corp., Chilacombe & Hwy 280, St. Paul 8, Minn.
Inland Steel Co., 30 W. Monroe St., Chicago 3, Ill.
Inland Steel Products Co., 4101 W. Burnham St., Milwaukee 1, Wis.
Inner-Tite Div. of Yara Engineering Corp., 18 W. Jersey St., Elizabeth 4, N. J.
Insto-Gas Corp., 998 E. Woodbridge St., Detroit 7, Mich.
Instrument Cases, Div. of TA Mfg. Corp., 4607 Alger St., Los Angeles 39, Calif.
Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
Instruments, Inc., P. O. Box 556, Tulsa, Okla.
Insul-Cell Mfg. Co., 2917 W. Jackson St., Muncie, Ind.

Insul-Coustic, Inc., 42-23 54th Rd., Maspeth, Long Island, N. Y.
Insul-Fil Co., Inc., Div. of Miracle Adhesives Corp., 250 Pettit Ave., Bellmore, Long Island, N. Y.
Insulite Div. Minnesota and Ontario Paper Co., 500 Investors Bldg., Minneapolis 2, Minn.
Insul-Mastic Corp. of America, 7750 W. 61st Place, Summit, Ill.
Insul-Wool Insulation Co., 962 Hays Ave., St. Louis, Mo.
Integral Corp., 100 Frank Road, Hicksville, Long Island, N. Y.
Inter-Coastal Paint Corp., 13th St. and Southern R. R., East St. Louis Ill.
Interchemical Corp., Finishes Div., 224 McWhorter St., Newark 1.
International Boiler Works Co., The, 5 Birch St., East Stroudsburg, Pa
International Business Machines Corp., 590 Madison Ave., New York 22, N. Y.
International Covers for Air Conditioners Corp., 532 Broadway, New York, N Y.
International Engineering, Inc., 1145 Bolander Ave., Dayton 1, O.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill
International Heater Co., 101 Park Ave., Utica 2, N. Y.
International Mfg. Co., 600 E. Grand Ave., Oklahoma City, Okla.
International Metal Hose Co., Ashford Ave., Bellevue, O.
International Metal Products Co., P. O. Box 1712, Phoenix, Ariz
International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
International Powder Metallurgy Inc., Ridgway, Pa.
International Register Co., 2620 W. Washington Blvd., Chicago 12, Ill
International Vermiculite Co., Girard, Ill.
Interstate Heater Mfg. Co., 2627 West 6th Ave., Denver, Colo.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Ionaire, Inc., 390 First St., San Francisco 5, Calif.
Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, O.
Iron Lung Ventilator Co., 5403 Prospect Ave., Cleveland 3, O.
Irvington Div., Minnesota Mining & Mfg. Co., 6 Argyle Terrace, Irvington 11, N. J.

J

Jabsco Pump Co., 2031 Lincoln St., Burbank, Calif.
Jack & Heintz, Inc., 17600 Broadway, Cleveland 1, O.
Jackes-Evans Mfg. Co., Controls Div., 4427 Geraldine Ave., St. Louis 15, Mo.
Jackson & Church Co., 321 N. Hamilton Ave., Saginaw 65, Mich.
Jackson-Marcus Supply Co., 3612 E. 26th St., Los Angeles 24, Calif.
Jaco Devices Co., 100 High St., Hingham, Mass.
Jaco Manufacturing Co., 9231 Clinton Ave., Cleveland 9, O.
James Foundry Corp., Ft. Atkinson, Wis.
Jamesbury Corp., 45 New St., Worcester 5, Mass.
Jamieson Mfg. Co., 517 Bedford St., Dallas 12, Tex.
Jan-Air, Inc., Richmond, Ill.
Janette Elect. Mfg. Co., Lehigh at Main, Morton Grove, Ill.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., 400 Dublin Ave., Columbus, O.
Jarrow Products, Inc., 1238-50 W. Fullerton, Chicago 14, Ill.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Union Co., 31 Fletcher Ave., Lexington 73, Mass.
Jeffrey Mfg. Co., 859 N. Fourth St., Columbus 16, O.
Jemco Tool Corp., 22 State St., Seneca Falls, N. Y.
Jenkins Bros., 100 Park Ave., New York 17, N. Y.
Jenn-Air Products Co., 1102 Stadium Drive, Indianapolis 7, Ind.
Jennison Co., The, 87 Putnam St., Fitchburg, Mass.
Jessop Steel Co., Washington, Pa.
Jet-Heet, Inc., 152 S. Van Brunt St., Englewood, N. J.
Jet-Lube, Inc., 3093 N. California St., Burbank, Calif.
Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.
Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.
Johnson Co., S. T., 940 Arlington Ave., P. O. Box 8152, Oakland 8, Calif.
Johnson Corp., The, 806 Wood St., Three Rivers, Mich.
Johnson Degree Day Systems, 329 S. Pitcher St., Kalamazoo, Mich.
Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
Johnson Heater Corp., 1 Winnisimet St., Chelsea, Mass.
Johnson Machine Works, 619 Menomonie St., Eau Claire, Wis.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson-March Corp., 3018 Market St., Philadelphia 4, Pa.
Johnson Metal Hose, Inc., 10 Sperry St., Waterbury 20, Conn.
Johnson Plastics Corp., Box 100, Chagrin Falls, Ohio.
Johnson Service Co., 507 E. Michigan St., Milwaukee 1, Wis.
Johnson-Williams Inc., 2625 Park Blvd., Palo Alto 24, Calif.
Johnston Bros., Inc., Ferrysburg, Mich.
Johnston & Chapman Co., 2925 Carroll Ave., Chicago 12, Ill.
Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo.
Johnston & Jennings Co., 6917 Bessemer Ave., Cleveland 27, O.
Johnston Pump Co., A Div. of the Youngstown Sheet & Tube Co. P. O. Bin "K", Pasadena 15, Calif.
JO-Line Tools, Inc., 8442 Otis St., South Gate, Calif.
Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Jones & Laughlin Steel Corp., Stainless Steel Div., Box 4606, Detroit, Mich.
Jones Machinery Div., Hewitt-Robins, Inc., 4401 Roosevelt Rd., Chicago.
Jordan & Co., Inc., Paul R., 520 S. New Jersey St., Indianapolis 25, Ind.
Josam Manufacturing Co., Corymbo Rd., Michigan City, Ind.
Joslyn Mfg. & Supply Co., 155 N. Wacker Dr., Chicago, Ill.
Joy Mfg. Co., Dept. 20, Henry W. Oliver Bldg., Pittsburgh 22, Pa.
Justrite Mfg. Co., 2061 N. Southport Ave., Chicago 14, Ill.

K

K-G Equipment Co., 1744 Lehigh St., Allentown, Pa.
KSM Products, Inc., Yale & Woodland Ave., Merchantville, N. J.
Kaiser Aluminum & Chemical Sales, Inc., Kaiser Center, Oakland, Calif.
Kaiser Co., E. B., 2114 W. Lake Ave., P. O. Box 47, Glenview, Ill.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Kalamazoo Tank & Silo Co., Machine Tool Div., 500 Harrison St., Kalamazoo 16, Mich.
Kam Products Corp., 245 Alabama Ave., Brooklyn, N. Y.
Kane Mfg. Corp., Kane, Pa.
Kass Hardware & Supply Co., Inc., 443 East Tremont Ave., Bronx 57, N. Y.
Kates Co., W. A., The, 430 Waukegan Rd., Deerfield, Ill.
Kato Engineering Co., 1415 First Ave., Mankato, Minn.
Kaufman Co., H. J., The, 13215 Roselawn Ave., Detroit 38, Mich.
Kaustine Furnace & Tank Corp., 1492 Washington Ave., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kaye & McDonald, Inc., 11-15 Central Ave., West Orange, N. J.
Kaykor Industries, Inc., Yardville, N. J.
Kaylo Div., Owens-Corning Fiberglas Corp., 717 Fifth Ave., New York 22, N. Y.
Keasbey Co., Robert A., 139-149 W. 19th St., New York, N. Y.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Keckley Co., O. C., 3400 Cleveland St., Skokie, Ill.
Keco Industries, Inc., 2438 Beekman St., Cincinnati 14, O.
Keeler Co., E., 238 West St., Williamsport 3, Pa.
Keeney Mfg. Co., Main St., Newington 11, Conn.
Keflex Mfg. Div., U. S. Flexible Metallic Tubing Co., 63 Main St., San Francisco 5, Calif.
Keldur Div. of Quimby & Co., 80 Oakdale Rd., Chester, N. J.
Keleket X-Ray Corp., 1601 Trapelo Rd., Waltham 54, Mass.
Kellogg Co., M. W., The, 711 3rd Ave., New York 17, N. Y.
Kelvinator Div., American Motors Corp., 14250 Plymouth Rd., Detroit, Mich.
Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Calif.
Kenco Pump Div., American Crucible Products Co., 1305 Oberlin Ave., Lorain, O.
Kendall Co., Polyken Sales Div., 309 W. Jackson Blvd., Chicago 6, Ill.
Kendall Co., Walpole, Mass.
Kenite Laboratory, 23 Samson Ave., P. O. Box 268, Madison, N. J.
Kenmore Machine Products, Inc., 15 Depew Ave., Lyons, N. Y.
Kennard Products, American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kenney Co., L. C., 2300 W. 59th St., Chicago 36, Ill.
Ken-Ray Brass Products, Inc., Vermont, Ill.
Kensico Tube Co., Mt. Kisco, N. Y.
Kent Co., Inc., 716 Canal St., Rome, N. Y.
Kent-Moore Organization, Inc., 28635 Mound Rd., Warren, Mich.
Ken-Way Corp., Sparta, Wis.
Kepner Products Co., 7303 W. 59th St., Summit, Ill.
Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh 22, Pa.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Key-Hak Div., Producers & Distributors, Inc., 1321 Hanover Ave., Allentown, Pa.
Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.
Keystone Valve Corp., P. O. Box 6716, Houston 5, Tex.
Kice Metal Products Co., 2040 So. Mead Ave., Wichita 11, Kans.
Kidde Mfg. Co., Inc., 35 Farrand St., Bloomfield, N. J.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 64 Genung St., Middletown, N. Y.
Kilbury Mfg. Co., Inc., 14529 Hawthorne Blvd., Lawndale, Calif.
Kilgore, Inc., International Flare-Signal Div., Westerville, O.
Killebrew Engineering Corp., 8640 Pardee Lane, St. Louis 23, Mo.
King Co. of Owatonna, The, 928 N. Cedar St., Owatonna, Minn.
King Engineering Corp., 945 Willard Ave., Ann Arbor, Mich.
King Refrigerator Co., 76-02 Woodhaven Blvd., Glendale, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
King Zeero Co., The, 4300 — 14 W. Montrose Ave., Chicago 41, Ill.
Kingsford Foundry & Machine Wks., 264 W. Second St., Oswego, N. Y.
Kingston-Conley, Inc., Div. of the Howell Electric Motors Co., Plainfield, N. J.
Kinney Mfg. Div., The New York Air Brake Co., 3529 Washington St., Boston 30, Mass.
Kirk & Blum Mfg. Co., 3130 Forrer St., Cincinnati 9, O.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kisco Boiler & Engineering Co., 2414 Dekalb St., St. Louis 4, Mo.
Klauer Mfg. Co., 9th and Washington Sts., Dubuque, Ia.
Kleen-Air Mfg. Co., 225 N. Main St., Box 302, Janesville, Wis.
Kleer Kleen Mfg. Co., 103 Orchard Ave., Hayward, Calif.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros., Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.
Klipfel Valves, Inc., 1075 Lincoln Ave., Hamilton, O.
Knapp Bros. Mfg. Co., 9000 Shell Rd., Cincinnati 36, O.
Knapp Mills, Inc., 23-15 Borden Ave., Long Island City 1, N. Y.
Knight, Maurice A., Kelly Ave., Akron 9, O.
Knowles Mushroom Ventilator Co., 160 Bellevue Ave., Upper Montclair, N. J.
Kobe Inc., 3040 E. Slauson, Huntington Park, Calif.
Kody Blower Co., 200 Bunting Ave., Trenton 5, N. J.
Kohlenberger Engineering Corp., 1600 W. Commonwealth Ave., Fullerton, Calif.
Kol-Master Corp., 161 Walberg St., Oregon, Ill.
Kool Engineering Corp., 1320 N. Clybourn Ave., Chicago 18, Ill.
Kool-Kar Co., Inc., 1468 Penobscot Bldg., Detroit, Mich.
Kopperman & Sons, Inc., Joseph, 316 New St., Philadelphia 6, Pa.
Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.
Koppers Co., Inc., Aeromaster Fan Dept., 6809 Scott St., Baltimore 3, Md.

Koppers Co., Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Korfund Co., Inc., 48-01-F 32nd Pl., Long Island City 1, N. Y.
Koven & Bro. Inc., L. O., 154 Ogden Ave., Jersey City 7, N. J.
Kraissl Co., Inc., The, Terhune and Williams Aves., Hackensack, N. J.
Kraloy Plastic Pipe Co., Inc., 4720 E. Washington Blvd., Los Angeles.
Kramer Trenton Co., N. Olden & Breunig Aves., Trenton 5, N. J.
Kresky Mfg. Co., Inc., Second & H Streets, Petaluma, Calif.
Krieg, Inc., Victor J., 611 Broadway, New York, N. Y.
Kritzer Radiant Coils, Inc., 325 North River St., Batavia, Ill.
Krueger Air Conditioning Co., 19 E. Rillito St., Tucson, Ariz.
Krueger Sentry Gauge Co., 1056 W. Mason St., Green Bay, Wis.
Krylon, Inc., Ford & Washington Sts., Norristown, Pa.
Kuhns Bros. Co., 1800 McCall St., Dayton 8, O.
Kulka Electric Corp., 633 S. Fulton Ave., Mt. Vernon, N. Y.
Kunkle Valve Co., 121 S. Clinton St., Ft. Wayne 2, Ind.
Kurz & Root Co., Appleton, Wis.

L

L. K. Iron Works, 3531 Third Ave., New York, N. Y.
L M R Engineering Corp., Clayton P. O. Box 106, St. Louis 5, Mo.
L. R. P., Inc., Leicester, N. Y.
Laars Engineers, 13246 Saticoy St., North Hollywood, Calif.
Labelon Tape Co., Inc., 450 Atlantic Ave., Rochester 9, N. Y.
LaBour Co., Inc., The, 1607 Sterling Ave., Elkhart, Ind.
Laclede Steel Co., Arcade Bldg., Rm. 1317, St. Louis 1, Mo.
Laclede Stoker Co., 4438 Hunt Ave., St. Louis 10, Mo.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
Ladish Co., 5300 S. Packard Ave., Cudahy, Wis. (Milwaukee Suburb).
Ladish Co., Tri-Clover Div., 2809 60th St., Kenosha, Wis.
LaFavorite Rubber Mfg. Co., 256 Wagaraw Rd., Hawthorne, N. J.
Laharco Industries, 721-2nd Ave., N., Minneapolis 5, Minn.
Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill.
Lakewood Engineering & Mfg. Co., 212 N. Carpenter St., Chicago 7, Ill.
Laminated Sheet Products Corp., 449 Neponset St., Norwood, Mass.
Lammert & Mann Co., Wood & Walnut Sts., Chicago 12, Ill.
Lamson & Sessions Co., The, 5000 Tiedeman Rd., Cleveland 9, O.
Lancaster Pump & Mfg. Co., 1340 Manheim Pike. Lancaster, Pa.
Landis Machine Company, Fifth and Church Sts., Waynesboro, Pa.
Lapp Insulator Co., LeRoy, N. Y.
Laramy Products Co., 90 South St., Hingham, Mass.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
LaSalle Products, Inc., 143 Seneca St., Buffalo 3, N. Y.
Lastik Paint, Inc., 201 Iroquois Bldg., Pittsburgh 13, Pa.
Lattner Mfg. Co., P. M., 1411-9th St., S. W., Cedar Rapids, Iowa.
Lau Blower Co., 2027 Home Ave., Dayton 7, O.
Lawler Automatic Controls, Inc., 453 N. MacQuesten Pkwy., Mount Vernon, N. Y.
Lawrence Pumps Inc., 371 Market St., Lawrence, Mass.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Layne & Bowler, Inc., Box No. 6697, Hollywood Sta., Memphis 8, Tenn.
Layton Co., Inc., 4711 S. Whitnall Ave., Cudahy, Wis.
Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Lead Lined Iron Pipe Co., 1 Broadway, Wakefield, Mass.
Leahy Mfg. Co., 1804 E. 8th St., Los Angeles 21, Calif.
Leavitt Machine Co., East River St., Orange, Mass.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledeen Mfg. Co., 3350 No. Gilman Rd., El Monte, Calif.
Lee Corp., P. O. Box 1801, Wilmington, Del.
Lee Vine Fin-Tube Radiator Co., Inc., 10 Fair St., New Haven, Conn.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lees Div., John, The, Serrick Corp., Batavia St. and Kilgore Ave., Muncie, Ind.
Leffel & Co., James, The, 426 East St., Springfield, O.
Lehigh Fan & Blower Div., Fuller Co., 124 Bridge St., Catasauqua, Pa.
Lehigh Mfg. Co., Div. of Lehigh, Inc., Easton, Pa.
Leibfried Mfg. Corp., C. H., 95 Guernsey St., Brooklyn 22, N. Y.
Leiman Bros., Inc., 163 W. Christie St., P. O. Box 1339, Newark, N. J.
Leland Ohio Electric Co., The, Subsid. of Howell Electric Motors Co., 1501 Webster St., Dayton 1, O.
Lemlar Mfg. Co., 715 W. Redondo Beach Blvd., Gardena, Calif.
Lenco, Inc., 350 W. Adams St., Jackson, Mo.
Lenk Mfg. Co., Franklin, Ky.
Lenly Mfg. Co., Inc., 901 E. 9th St., Los Angeles 21, Calif.
Lennox Industries Inc., Marshalltown, Ia.
Lennox Industries Inc., 1711 Olentangy River Rd., Columbus, O.
Lennox Industries Inc., Box 1294, Des Moines, Ia.
Lenz Co., 3301 Klepinger Rd., Dayton 1, O.
Leonard Precision Products Co., 9200 Bolsa Ave., Santa Ana, Calif.
Leonard Valve Co., 1360 Elmwood Ave., Cranston 7, R. I.
LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.
Leslie Co., 237 Grant Ave., Lyndhurst, N. J.
Leslie Welding Co., Inc., 2943 Carroll Ave., Chicago 12, Ill.
Lester Laboratories, Inc., P. O. Box 4897, Atlanta 2, Ga.
Levow, Inc., David, 7 Georgia St., South Hackensack, N. J.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Co., Div. of Cerro de Pasco Corp., 1111 Chouteau Ave., St. Louis 2, Mo.
Lewis & Saunders, Inc., Lakeport, N. H.
Lewis Mfg. Co., Inc., 3044 S. W. 28th Lane, Miami 33, Fla.
Lexsuco, Inc., 33095 Bainbridge Rd., Solon, O.
Leyman Mfg. Corp., John H. McGowan Co. Div., 1416 First National Bank Bldg., Cincinnati 2, O.
Liaison Engineering Services, P. O. Box 5, Garland, Tex.
Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo 3, O.
Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Liberty Combustion Corp., E. Molloy Rd., Industrial Park, P. O. Box 300, Syracuse 1, N. Y.
Librascope, Inc., Commercial Div., 133 East Santa Anita Ave., Burbank, Calif.
Lidseen of North Carolina. Inc., 1000 First St., Hayesville, N. C.
Lientz Co., B. P., 2132 Jefferson, Kansas City 8, Mo.
Lilie-Hoffmann Cooling Towers, Inc., 1450 So. Vandeventer Ave., St. Louis 10, Mo.
Lima Electric Motor Co., Inc., The, Lima, O.
Lima Register Co., The, 1790 N. Cable Rd., Lima, O.
Lincoln Electric Co., The, 22801 St. Clair Ave., Cleveland 17, O.
Linde Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.
Lindy Heaters, Inc., 2370 Hoffman St., New York 58, N. Y.
Line Material Industries, McGraw-Edison Co., 700 W. Michigan, Milwaukee 1, Wis.
Linear Incorporated, N. W. Cor. State Rd. & Levick St., Philadelphia 35, Pa.
Link-Belt Co., Prudential Plaza, Dept. HPAC-59, Chicago 1, Ill.
Lintern Corp., Route 20 East, Painesville, O.
Liquidometer Corp., 37-15 Skillman Ave., Long Island City 1, N. Y.
Liqui-Therm Co., 3220 N. 126th St., Brookfield, Wis.
Lithcote Corp., 5000 W. Lake St., Melrose Park, Ill.
Little Brass Goods Co., M. S., 151 New Park Ave., Hartford 6, Conn.
Little Giant Pump Co., Div. of Little Giant Vaporizer Co., Inc., 3810 N. Tulsa, P. O. Box 7025, Oklahoma City, Okla.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, O.
Locke Regulator Co., Walter and Osborne Sts., Salem, Mass.
Lockformer Co., The, 4615 W. Roosevelt Rd., Chicago 50, Ill.
Lockport Mills, Inc., Lockport, N. Y
Logan Clay Products, The, Box 698, Logan, O.
London Chemical Co., 1535 N. 31st Ave., Melrose Park, Ill.
Longergan Co., J. E., 2nd and Race Sts., Philadelphia 6, Pa.
Lookout Boiler & Mfg. Co., Compress St. & Mfrs. Rd., Chattanooga 1, Tenn.
Lord & Clark Co., Inc., 791 Tremont St., Boston 18, Mass.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Louisville Drying Machinery Unit, General American Transportation Corp., 139 So. 4th St., Louisville 2, Ky.
Lovejoy Flexible Coupling Co., 4987 W. Lake St., Chicago 44, Ill.
Lowell Wrench Co., 97 Temple St., Worcester 4, Mass.
Lucey Boiler & Mfg. Corp., 1514 Chestnut St., Chattanooga 8, Tenn.
Ludlow Valve Mfg. Co., Inc., The, Foot of Adams St., Troy, N. Y.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., The, 355 Lancaster Ave., Haverford, Pa.
Lukens Steel Co. and Divisions, 308 S. First Ave., Coatesville, Pa
Lumm Co., A. H., 3151 South Ave., Toledo 9, O.
Lunkenheimer Co., P. O. Box 360, Annex Station, Cincinnati 14, O.
Lurie & Lurie, 560 W. Washington, Chicago 6, Ill.
Luzerne Rubber Co., Muirhead Ave., Trenton 7, N. J.
Lynch Asbestos Co., 2939 So. Sunol Drive, Los Angeles 23, Calif.
Lynchburg Foundry Co., Courtland Bldg., Lynchburg, Va.

M

M B Electronics, P. O. Box 1825, New Haven 8, Conn.
M & E Mfg. Co., 2571 Winthrop Ave., Indianapolis, Ind.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
M-M-A, Inc., Coho Bldg., Lancaster. Pa.
M-M-M, Inc., 1315 Hutchins, P. O. Box 2114, Houston, Tex.
Maas & Waldstein Co., 2121 McCarter Highway, Newark 4, N. J.
Macksons Co., 125 Cedar St., New York 6, N. Y.
Mac-Lean-Fogg Lock Nut Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Madden Brass Products Co., P. O. Box 444, Aurora, Ill.
Madden Corp., The, 1345 Jarvis Ave., Chicago, Ill.
Magic Aire Div., United Electric Co., P. O. Box 119, Wichita Falls, Tex.
MaGirl Foundry & Furnace Co., 413 E. Oakland Ave., P. O. Box 636, Bloomington, Ill.
Magnatrol Valve Corp., 67 5th Ave., Hawthorne, N. J.
Magnetic Seal Corp., 301 Sowams Rd., Barrington, R. I.
Magnetrol, Inc., 2110 S. Marshall Blvd., Chicago 23, Ill.
Magnode Products, Inc., Box 292, Trenton, O.
Magnus Chemical Co., South Ave., Garwood, N. J.
Mahon Co., R. C., The, P. O. Box 4666, Detroit 34, Mich.
Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.
Main Cornice Works, Inc., 2824 North Main St., Los Angeles, Calif.
Majac Inc., 23rd St., Sharpsburg, Pittsburgh 15, Pa.
Major Controls, P. O. Box 537, Corona, Calif.
Malleable Iron Fittings Co., Branford, Conn.
Mallory & Co., Inc., P. R., 62 S. Gray St., Indianapolis 6, Ind.
Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif.
Mammoth Furnace Co., 6425 Cambridge St., Minneapolis 16, Minn.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manheim Mfg. & Belting Co., 325 Stiegel St., Manheim, Pa.
Manitowoc Shipbuilding, Inc., 16th & The River, Manitowoc, Wis.
Mannesmann-Easton Plastic Products Co., Inc., 900 Line St., Easton, Pa.
Manning Co., Charles E., 90 Clairton Blvd., Pittsburgh 36, Pa.
Manning & Lewis Engineering Co., 32 Ogden St., Newark 4, N. Y.
Manning, Maxwell & Moore, Inc., 250 East Main St.. Stratford, Conn.
Mansfield & Green, Inc., 1051 Power Ave., Cleveland 14, O.
Manufacturers Corp., 104 Ausdale Ave., P. O. Box 434, Mansfield, O.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
Maple City Furnace Co., Monmouth, Ill.
Maplewood Div., Rockford Machine Tool Co., 2500 Kishwaukee St., Rockford, Ill.

Marathon Electric Mfg. Corp., Cherry and Randolph Sts., P. O. Box 630, Wausau, Wis.
Marble Electric Corp., Gladstone, Mich.
March Mfg. Co., Inc., 8015 N. Lawndale Ave., Skokie, Ill.
Marco Development Co., Inc., P. O. Box 325, Wilmington 99, Del.
Marco Electric Mfg. Corp., 3d & Franklin Sts., Womelsdorf, Pa.
Mar-Coil Heater Co., 200 Paterson Plant Rd., Union City, N. J.
Marion Machine Foundry, Inc., P. O. Box 989, Marion, Ind.
Markal Co., 3052 W. Carroll Ave., Chicago 12, Ill.
Marley Co., The, 222 West Gregory Blvd., Kansas City 14, Mo.
Marlin-Rockwell Corp., 402 Chandler St., Jamestown, N. Y.
Marlo Coil Co., 7100 S. Grand Ave., St. Louis 11, Mo.
Marlow Pumps, Division of Bell & Gossett Co., P. O. Box 200, Midland Park, N. J.
Marman Div., Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64.
Marquette Coppersmithing Co., Christian & Water Sts., Philadelphia 47, Pa.
Marquette Mfg. Co., Inc., 307 E. Hennepin Ave., Minneapolis 14, Minn.
Marsh Heating Equipment Co., Div. of Colorado Oil & Gas Corp., 3501 Howard St., Skokie, Ill.
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp., 3501 Howard St., Skokie, Ill.
Marsh Valve Co., 4th St. & Brigham Rd., Dunkirk, N. Y.
Marshalltown Mfg. Co., 901 E. Nevada, Marshalltown, Ia.
Marsto Machine Co., 231 Willard St., West Quincy 69, Mass.
Martin Co., Inc., J. O., 637 Minna St., San Francisco 3, Calif.
Martin Fan & Blower Co., 4634 W. 21st Pl., Chicago 50, Ill.
Martin & Sons, H. P., 801 W. 12th St., Owensboro, Ky.
Marvel Engineering Co., 7227 N. Hamlin Ave., Chicago 45, Ill.
Marviray, Inc., 54 Clifton St., Newark 5, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Mason Products, Inc., 18 Cranes Ct., Woburn, Mass.
Master-Bilt Refrigeration Mfg. Co., 4209 Folsom Ave., St. Louis 10, Mo.
Master Control Co., The, 2034 Fifth St., Cuyahoga Falls, O.
Master Electric Co., Div. of Reliance Electric & Engineering Co., 126 Davis Ave., Dayton 1, O.
Master Fan Corp., 1323 Channing St., Los Angeles 21, Calif.
Master Mechanics Co., The, Miles Ave. at E. 175th St., Cleveland 28, O.
Master Products Co., 7000 S. Wentworth, Chicago 21, Ill.
Master Vibrator Co., 361 Stanley Ave., Dayton, Ohio.
Mastro-Hoskinson Mfg. Corp., Inc., 640 Hempstead Turnpike, Franklin Sq., Long Island, N. Y.
Mathes Co., The, Div. Glen Alden Corp., 1500-29 E. Broadway, Ft. Worth, Tex.
Mathey Machine Works, Inc., C. A., P. O. Box 1159, Tulsa, Okla.
Matrix Engineering Corp., 3016 E. Lake St., Minneapolis 6, Minn.
Matthews Electric Heater Mfg. Co., Albertville, Ala.
Matthiessen & Hegeler Zinc Co., 9th & Sterling Sts., La Salle, Ill.
Mauney, Rowe A., Box 623, Marion, N. C.
Maurath, Inc., 21800 Miles Ave., Cleveland 22, O.
Maurey Mfg. Corp., 2907 S. Wabash Ave., Chicago 16, Ill.
Maurlee Co., Inc., South Evergreen Ave., Woodbury Heights, N. J.
Maxitrol Co., 12200 Beech Rd., Detroit 39, Mich.
Maxon Premix Burner Co., P. O. Box 71, Muncie, Ind.
May Company, Galesburg, Ill.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
McAlear Mfg. Co., 1921 S. Western Ave., Chicago 8, Ill.
McAuley Trap Co., 104 First Ave., Pittsburgh 22, Pa.
McCord Corp., 2587 E. Grand Blvd., Detroit 11, Mich.
McCorkle Co., D. H., 6th & Bancroft Way, Berkeley 10, Calif.
McDonald Mfg. Co., A. Y., 12th & Pine Sts., Dubuque, Iowa.
McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill.
McGraw-Edison Co., Clark Div. & Tropic-Aire Div., 5201 W. 65th St., Chicago 28, Ill.
McIntire Co., The, Okner Parkway, P. O. Box 5, Livingston, N. J.
McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.
McLarty Systems, 2600 Dickman Rd., Battle Creek, Mich.
McMillan Comfortaire, Inc., P. O. Box 5897, 1501 Miami Rd., Jacksonville 7, Fla.
McMillan Industrial Supplies, C. C., 3912 S. W. Dolph Court, Portland 19, Oregon.
McNeill Smoke Eliminator Co., 523 N. Halsted, Chicago, Ill.
McPherson Furnace & Supply Co., 1805 N. E. Second Ave., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13, Minn.
McQuay-Norris Mfg. Co., Southwest Ave. at Marconi, St. Louis 10.
McRae Specialty Co., Don, 750 N. Glendale Ave., Glendale 6, Calif.
McWane Cast Iron Pipe Co., 1201 Vanderbilt Rd., Birmingham 2, Ala.
Mearlcrete Div., Mearl Mfg. Corp., 220 Westfield Ave., W., Roselle Park, N. J.
Mears Electric Controls, Inc., P. O. Box 3798, Portland, Ore.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., P. O. Box 223, Bridgeport, Pa.
Mechanical Industries Production Co., 217-223 Ash St., Akron 8, O.
Mechanical Products Corp., 1716 W. Hubbard St., Chicago 22, Ill.
Mechanical Products, Inc., 1824 River, Jackson, Mich.
Meier Electric, 3525 E. Washington St., Indianapolis 7, Ind.
Mel Products Co., The, Fonton Rd., East Haven, Conn.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Memco Crane Co., 1007 N. W. 36th St., Oklahoma City 18, Okla.
Memphis Pump & Mfg. Co., P. O. Box 3215, Memphis, Tenn.
Menardi & Co., 1222 E. Grand Ave., El Segundo, Calif.
Mercer Rubber Co., 146 Mercer St., Hamilton Sq., N. J.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46, Pa.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton 6, O.
Mercury Hydraulics, Inc., 1632 Wazee St., Denver 2, Colo.
Meriam Instrument Co., The, 10929 Madison Ave., Cleveland 2, O.
Mesker Steel Corp., Geo. L., 400 N. W. First St., Evansville 8, Ind.
Metalcraft Inc., Mason City, Ia.
Metal Fabricators, Inc., P. O. Box 3232, Charlotte 3, N. C.
Metal Industries, Inc., P. O. Box 479, Clearwater, Fla.
Metal Mfg. Co., 114 N. W. 5th St., Ft. Lauderdale, Fla.
Metal Products Eng., Inc., 4000 Long Beach Ave., Los Angeles 58.
Metal & Thermit Corp., Rahway, N. J.
Metallo Gasket Co., 16 Bethany St., New Brunswick, N. J.
Metallurgical Products Dept. of General Electric Co., 11177 E. 8 Mile Rd., Detroit, Mich.
Metalmaster Corp., 66 Elm St., Newark 5, N. J.
Metalweld, Inc., Industrial Maintenance Div., Scotts Lane & Abbottsford Ave., Philadelphia 29, Pa.
Met-L-Chek Co., 11919 S. Western Ave., Los Angeles 47, Calif.
Met-L-Wood Corp., 6755 W. 65th St., Chicago, Ill.
Metrex Valve Co., 9901 Franklin Ave., Franklin Park, Ill.
Metropolitan Refining Co., Inc., 50-23 Twenty-Third St., Long Island City 1, N. Y.
Meyer & Bro. Co., F., 308 S. Commercial St., Peoria 2, Ill.
Mever Furnace Co., The, P.O. Box 989, Peoria 1, Ill.
Meyer & Wenthe, Inc., 30 S. Jefferson St., Chicago, Ill.
Meyercord Co., The, 5323 West Lake St., Chicago, Ill.
Michael Electric Co., Inc., 15 Stiles St., New Haven, Conn.
Michigan Pipe Co., 2415 Burdette Ave., Ferndale 20, Mich.
Mic-Lin Co., Route 38 at Rudderow Ave., Maple Shade 6, N. J.
Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y.
Micro Products Co., 20 N. Wacker Dr., Chicago 6, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
Microtron Corp., P. O. Box 2092, Charlotte, N. C.
Midco Register Corp., 1059 Grand Ave., St. Paul, Minn.
Mid-Continent Metal Products Co., 1960 Clybourn Ave., Chicago 4, Ill.
Middlesex Paper Tube Co., Inc., 345 Chemsford St., Lowell, Mass.
Midland Industrial Div., The Harrison Paint & Varnish Co., 1329 Harrison Ave., S. W., Canton, O.
Mid-States Welder Mfg. Co., 6025 S. Ashland Ave., Chicago 36, Ill.
Midwesco, Inc., 1650 N. Elston, Chicago, Ill.
Midwest Air Conditioning Co., 510 Third St., Des Moines, Ia.
Midwest Airmoving Corp., 4498 Beidler Rd., Willoughby, O.
Midwest Automatic Control Co., 510 Third St., Des Moines, Ia.
Midwest Noise Control, 5420 College Ave., Indianapolis 20, Ind.
Midwest Piping Co., Inc., 1450 S. Second St., St. Louis 4, Mo.
Midwest Pump Div. of Sherwood Mfg. Co., 500 N. Dodgion, Independence, Mo.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller-Harris Instrument Co., 1134 S. 1st St., Milwaukee 2, Wis.
Miller Mfg. Co., 251 W. Kellog Blvd., St. Paul 2, Minn.
Miller Valve Co., Inc., 1620 Pennsylvania Ave., Pittsburgh 33, Pa.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mill-Rose Co., 1985 E. 59th St., Cleveland, O.
Milton Equipment Co., N. E. Cor. 4th Race St., Philadelphia 6, Pa.
Milton Roy Co., 1371 E. Mermaid Ave., Philadelphia 18, Pa.
Milwaukee Electric Tool Corp., 5362 W. State St., Milwaukee 8, Wis.
Milwaukee Valve Co., 2375 So. Burrell St., Milwaukee 7.
Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
Mine Safety Appliances Co., Velocity Power Tool Dept., 201 N. Braddock Ave., Pittsburgh 8, Pa.
Minerallac Electric Co., 25 N. Peoria St., Chicago 7, Ill.
Minneapolis-Honeywell Regulator Co., 2753 4th Ave., S., Minneapolis 8, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.
Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.
Minnesota Mining & Mfg. Co., Adhesives, Coatings & Sealers Div., 900 Bush Ave., St. Paul 6, Minn.
Minnesota & Ontario Paper Co., Insulite Div., Investors Bldg., Minneapolis, Minn.
Minnesota Rubber Co., 3630 Wooddale Ave., Minneapolis.
Minn-Kota Foundry & Mfg. Co., P. O. Box 576, Moorhead, Minn.
Miracle Adhesives Corp., 250 Pettit Ave., Bellmore, N. Y.
Mir-O-Col Alloy Co., Inc., 340 North Ave., 21, Los Angeles 31, Calif.
Mirror Patented Stove Pipe Co., 55-65 Park St., Hartford 14, Conn.
Misener Mfg. Co., Inc., 202-8 Walton St., Syracuse 2, N. Y.
Mississippi Glass Co., St. Louis 7, Mo.
Mitchell Co., John E., 3800 Commerce St., Dallas, Tex.
Mitchell & Co., Inc., W. K., 29th & Ellsworth, Philadelphia 46, Pa.
Mitchell Mfg. Co., 3200 W. Peterson Ave., Chicago, Ill.
Mitchell Radiation Products Corp., 128 E. Washington St., Norristown, Pa.
Mobil Oil Co., Inc., 150 E. 42nd St., New York 17, N. Y.
Mobile Drilling, Inc., 960 N. Pennsylvania, Indianapolis, Ind.
Modern Dust Bag Co., Inc., 132 E. Railroad Ave., West Haverstraw, N. Y.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3, Mo.
Modern Hanger Corp., The, 4734 Hough Ave., Cleveland 3, O.
Modernheat Cable Corp., Box 754, Kingsport, Tenn.
Modern Water Equipment Co., 230 E. Main St., Freeport, Ill.
Modine Mfg. Co., 1509 De Koven Ave., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, P. O. Box 1115, Cincinnati 1, O.
Molco Drilling Machines, Inc., 1100 20th St., N. W., Washington 6, D. C.
Molded Fiber Glass Sheet Co., 4304 Benefit Ave., Ashtabula, O.
Momar Industries, Inc., 4176 W. Montrose, Chicago 41, Ill.
Monarch Mfg. Works, Inc., 2523 E. Ontario St., Philadelphia 34, Pa.

Monash-Younker Co., Inc., 532 So. Throop St., Chicago 7, Ill.
Monitor Controller, 99 Grove St., Rockland, Mass.
Monogram Products Co., Inc., 731 N. 35th St., Philadelphia 4, Pa.
Mono-Seal Products, 44 Garden St., Everett 49, Mass.
Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, O.
Monsanto Chemical Co., Lindbergh & Olive St. Rd., St. Louis 24, Mo.
Monsanto Chemical Co., 812 Monsanto Ave., Springfield, Mass.
Montag Inc., 8701 N. Denver Ave., Portland 17, Ore.
Montgomery Bros., 1122 Howard St., San Francisco, Calif.
Montgomery Chemical Co., Jenkintown, Pa.
Moore Inc., Goodloe E., 2811 N. Vermilion, Danville, Ill.
Moore Co., The, 800 S. Missouri, Marceline, Mo.
Moore & Co., Samuel, Mantua, O.
Moore Dry Kiln Co., 1220 W. State St., Jacksonville, Fla.
Moore Products Co., H and Lycoming Sts., Philadelphia 24, Pa.
Moraine Products Div., General Motors Corp., Dayton 1, O.
Moran Flexible Joint Co., Div. of Railroad Products Co., 1551 Queen City Ave., Cincinnati 14, O.
Moran Paint Co., P. O. Box 193, Xenia, O.
Morehead Moisture Control, P. O. Box 3854, Parkgrove Sta., Detroit 5, Mich.
Morey, Dan, 814 S. Robertson Blvd., Los Angeles 15, Calif.
Mor-Flo Heater Corp., 2176 E. 76th St., Cleveland 3, O.
Morganite, Inc., Carbon Specialties Div., 3304 48th Ave., Long Island City 1, N. Y.
Morheat Corp., 5548 Stewart Corp., Cincinnati 27, O.
Morrill Motors, 3685 Northrop, Ft. Wayne, Ind.
Morris Coupling & Clamp Co., P. O. Box 10, Kittanning, Pa.
Morris Machine Works, Baldwinsville, N. Y.
Morris Sheet Metal Works, 1680 W. Mound St., Columbus 23, O.
Morrison Brothers Co., 24th & Elm Sts., Dubuque, Ia.
Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10, O.
Morse Boulger Destructor Co., 80 Fifth Ave., New York 11, N. Y.
Morse Chain Co., Ithaca, N. Y.
Morse-Smith-Morse Co., The, 165 Dexter Ave., Watertown 72, Mass.
Mortell Co., J. W., Kankakee, Ill.
Morton Engineering Service, Paul S., 5131 Meadowlark Lane, Kalamazoo, Mich.
Mt. Hawley Mfg. Co., Inc., 1209 W. Alta Rd., Peoria 4, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Muckle Mfg. Co., Owatonna 3, Minn.
Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.
Mueller Climatrol, Div. of Worthington Corp., 2005 W. Oklahoma Ave., Milwaukee 1, Wis.
Mueller Co., 512 W. Cerro Gordo St., Decatur, Ill.
Muellermist Irrigation Co., 2612 S. 9th Ave., Maywood, Ill.
Mueller Steam Specialty Co., Inc., 29 Meserole Ave., Brooklyn 22, N. Y.
Mult-A-Frame Corp., 1471 E. Atwater St., Detroit 7, Mich.
Multiplex Mfg. Co., Berwick, Pa.
Multi-Vent Div., Pyle-National Co., The, 1373 Kostner Ave., Chicago 51, Ill.
Muncie Gear Wks., Inc., 700 N. Wysor, Muncie, Ind.
Mundet Cork Corp., 7101 Tonnelle Ave., North Bergen, N. J.
Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City 4, N. J.
Munray Products, Div. of Fanner Mfg. Co., 12400 Crossburn St., Cleveland, O.
Murray Co. of Texas, The, P. O. Box 1517, Atlanta, Ga.
Murray Co., 11 W. Pennsylvania Ave., Towson 4, Md.
Murray Iron Wks. Co., 1106 Washington St., Burlington, Ia.
Murray Mfg. Co., D. J., 1002-24 Third St., Wausau, Wis.
Mutual Liquid Gas & Equipment Co., 17129 S. Broadway, Box 392, Gardena, Calif.
Myers & Bro. Co., F. E., The, Ashland, O.
Mystik Adhesive Products, Inc., 2635 N. Kildare Ave., Chicago 39, Ill.

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Nalco Chemical Co., 6277 W. 66th Pl., Chicago 38, Ill.
Narda Ultrasonics Corp., 625 Main St., Westbury, Long Island, N. Y.
Nash Engineering Co., 307 Wilson Ave., South Norwalk, Conn.
Nason Co., Clarkston, Mich.
National Acme Co., The, 170 E. 131st St., Cleveland 8, O.
National Airoil Burner Co., Inc., 1330 E. Sedgley Ave., Philadelphia 34, Pa.
National Aniline Div., Allied Chemical Corp., 40 Rector St., New York 6, N. Y.
National Asphalt Corp., Bulkley Building, Cleveland 15, O.
National Carbon Co., A Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.
National Clay Pipe Mfg., Inc., 1820 N. St., N.W., Washington, D. C.
National Controls, Inc., 15 Brook St., Newton 58, Mass.
National Cork Co., 1 Engle Street, Englewood, N. J.
National Cylinder Gas, Div. of Chemetron Corp., 840 N. Michigan Ave., Chicago 11, Ill.
National Dust Collector Corp., 549 W. Washington, Chicago 6, Ill.
National Engineering & Mfg. Co., 16th & Lamine St., Sedalia, Mo.
National Gas Equipment Co., Inc., P. O. Box 122, Denison, Tex.
National Grille & Register Co., 10740 Broadway Ave., Cleveland, O.
National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.
National Heater Co., Inc., 2475 Doswell Ave., St. Paul 8, Minn.
National Instrument Laboratories, Inc., 828 Evarts St., N.E., Washington 18, D. C.
National Lead Co., 111 Broadway, New York 6, N. Y.
National Lock Co., Inc., 1902 Seventh St., Rockford, Ill.
National Oil Burner Co. of N. Y., Inc., 614 Bergen St., Brooklyn, N. Y.
National Pipe Bending Co., 122 River St., New Haven 13, Conn.
National Pneumatic Co., Inc., 420 Lexington Ave., New York, N. Y
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Super Service Co., The, 1944 N. 13th St., Toledo 2, O.
National System of Garage Ventilation, Inc., 138 W. William, Decatur, Ill.
National Tube Div., United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
National-U. S. Radiator Corp., 944 Ash St., Johnstown, Pa.
National Valve & Mfg. Co., 3101 Liberty Ave., Pittsburgh 1, Pa.
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Navan Products Inc., 900 N. Sepulveda, El Segundo, Calif.
Naylor Pipe Co., 1269 E. 92nd St., Chicago 19, Ill.
Nazar Rubber Co., 2727 Avondale, Toledo 7, O.
Nebel Mfg. Co., P. O. Box 3942, Shaker Square Sta., Cleveland 20, O.
Nebraska Boiler Company, Inc., 235 N. 9th St., Lincoln, Nebr.
Neff-Perkins Co., 33 Stage Rd., Painesville, O.
Neilson Chemical Co., 2300 Gainsboro, Detroit 20 (Ferndale), Mich.
Neirad Industries, Inc., P. O. Box 865, Darien, Conn.
Nelson Electric Mfg. Co., 4041 S. Sheridan Rd., Tulsa, Okla.
Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13, Minn.
Neptune Meter Co., 19 W. 50th St., New York 20, N. Y.
Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia 36, Pa.
Newbery Mfg. Co., Inc., Talladega, Ala.
New Castle Products, Inc., New Castle, Ind.
New Departure Div., General Motors Corp., Bristol, Conn.
New England Carbide Tool Co., Inc., 55 Commercial St., Medford 55, Mass.
New England Gear Wks., Southington, Conn.
New England Valve Corp., 47 Lagrange St., P. O. Box 1047, Worcester, Mass.
New Haven Copper Co., The, Seymour, Conn.
New Hermes Engraving Machine Corp., 154 W. 14th St., New York 11, N. Y.
New London Engineering Co., 1700 Division St., New London, Wis.
New York Air Valve Corp., 1850 Atlantic Ave., Brooklyn 33, N. Y.
New York Belting & Packing Co., 1 Market St., Passaic, N. J.
New York Blower Co., 3159 Shields Ave., Chicago 16, Ill.
New York Brass Foundry, 405 Broome St., New York 13, N. Y.
Newage Industries, Inc., 222 York Road, Jenkintown 9, Pa.
Newark Controls Co., 15 Ward St., Bloomfield, N. J.
Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N. J.
Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.
Newman Electric Motors Inc., 357 Wilson Ave., Newark 5, N. J.
Niagara Blower Co., 405 Lexington Ave., Room 3516, New York 17.
Niagara Machine & Tool Wks., 637-697 Northland Ave., Buffalo 11, N. Y.
Niagara Products Co., 4311 E. Thomas Rd., Phoenix, Ariz.
Nibco, Inc., Elkhart, Ind.
Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40, Pa.
Nicholson & Co., W. H., 178 Oregon St., Wilkes-Barre, Pa.
Nicolet Industries, Inc., Hamilton, O.
Nielsen, Inc., E. V., 575 Hope St., P. O. Box 353, Glenbrook Sta., Stamford, Conn.
Nikoh Tube Co., 5000 S. Whipple, Chicago 32, Ill.
Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury 20, Conn.
Nooter Corp., 1400 S. Second St., St. Louis 4, Mo.
Norden-Ketay Corp., Instrument Systems Div., Wiley St., Milford, Conn.
Norgren Co., C. A., 3400 So. Elati St., Englewood, Colo.
Norky Mfg. Corp., P. O. Box 669, 714 Pike St., Covington, Ky.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Normal Chemical Co., 1630 Carroll Ave., St. Paul 4, Minn.
Norman Products Co., Inc., 1150 Chesapeake Ave., Columbus, O.
Norristown Asbestos Div., Nicolet Industries, Inc., Washington St., Norristown, Pa.
North American Asbestos Corp., 141 W. Jackson Blvd., Chicago 3, Ill
North American Mfg. Co., 4455 E. 71st St., Cleveland 5, O.
North American Mogul Products Co., The, Standard Bldg., Cleveland 13, O.
North Shore Nameplate, Inc., 214-27 Northern Blvd., Bayside, N. Y.
Northern Blower Co., 6428 Barberton Ave., Cleveland 2, O.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Columbia Heights P. O., Minneapolis 22, Minn.
Norton Co., 1 New Bond, Worcester 6, Mass.
Norwalk Air Conditioning Corp., 138 Water St., S. Norwalk, Conn.
Norwood Associated Engineers Inc., 904 Columbus Ave., Springfield, Mass.
Norwood Controls, A Unit of Detroit Controls, 934 Washington St., Norwood, Mass.
Norwood Products Co., Div. of A. R. Wood Mfg. Co., Luverne, Minn.
Novo Pump & Engine Co., 702 Porter, Lansing, Mich.
Nuclear and Power Equipment Corp., 298 East Grand Ave., S. San Francisco, Calif.
Nuclear Products Co., 15635 Saranac Rd., Cleveland 10, O.
Nuclear Systems, A Div. of the Budd Co., Philadelphia 32, Pa.
Nugent & Co., Inc., Wm. W., 3440 Cleveland, Skokie, Ill.
Nupla Mfg. Co., 1026 N. Sycamore, Los Angeles 38, Calif.
Nutmeg Chemical Co., 134 Haven St., New Haven, Conn.
NuTone, Inc., Madison & Red Banks Rds., Cincinnati 27, O.
Nutt Co., Buell W., 11614 W. Pico Blvd., Los Angeles 64, Calif.
Nu-way Corp., The, 2416 4th Ave., Rock Island, Ill.
Nyberg, Stig C., 33 Redfield St., Rye, N. Y.
Nye Tool Co., 4120-30 Fullerton Ave., Chicago 39, Ill.
Nylok Corp., The, 611 Industrial Ave., Paramus, N. J.
Nylon Molding Corp., 141 S. Avenue, Garwood, N. J.

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OPW-Jordan, 6013 Wiehe Rd., Cincinnati 13, O.

O.T.M. Corp., 7340 Katy Rd., Houston 24, Tex.
Oakite Products, Inc., 19 Rector St., New York 6, N. Y.
Obear & Sons, Inc., 940 W. Florence Ave., P. O. Box 406, Inglewood 1, Calif.
Oberdorfer Foundries, Inc., 3007 Thompson Rd., Syracuse, N. Y.
O'Brien Steam Specialty Co., Inc., P. O. Box 217, Eastwood Station, Syracuse 6, N. Y.
Octagon Process, Inc., 58 Bank St., Staten Island 1, New York.
Octagon Ventilator Co., 5828-30 S. Oakley Ave., Chicago 36, Ill.
Ohio Brass Co., 380 N. Main St., Mansfield, O.
Ohio Electric Mfg. Co., 5400 Dunham Rd., Maple Heights, O.
Ohio Foundry & Mfg. Co., Penn R. R. & Slack St., Stubenville, O.
Ohio Injector Co., 275 Main St., Wadsworth, O.
Ohio Nut & Bolt Co., 33 First Ave., Berea, O.
Ohio Pipe Bending & Machine Co., 3900 Trent Ave., Cleveland 9, O.
Ohmlac Paint & Refining Co., Inc., 41-40 Crescent Ave., Long Island City, N. Y.
Oil Equipment Mfg. Corp., 169 Derby Ave., New Haven, Conn.
Okadee Co., 332 S. Michigan, Chicago, Ill.
Okonite Co., The, Passaic, N. J.
Old Dominion Iron & Steel Corp., Belle Isle, Richmond, Va.
Olin Aluminum Div., Olin Mathieson Chemical Corp., 400 Park Ave., New York, N. Y.
Olin Mathieson Chemical Corp., Chemicals Div., Mathieson Bldg., Baltimore 3, Md.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Olsen Mfg. Co., C. A., Elyria, O.
Olsen Testing Machine Co., Tinius, Easton Rd., Willow Grove, Pa.
Omark Industries, Inc., 9701 S.E. McLoughlin Blvd., Portland 22, Ore.
Omega Products, 4700 W. Washington Blvd., Chicago 44, Ill.
Onan & Sons Inc., D. W., 2515 University S. E., Minneapolis 14, Minn.
O'Neil-Irwin Mfg. Co., 541 Eighth, Lake City, Minn.
Optimum Control Corp., 2930 Woodhill Rd., Cleveland 4, O.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Orbit Sales Co., Inc., 185 Church St., New Haven, Conn.
O'Reilly Engineering Co., 4924 W. Davis, Dallas 11, Tex.
Ormsby-Osterman, Inc., 3631 Cass Ave., St. Louis 13, Mo.
Orr & Sembower, Inc., Box 1138, Reading, Pa.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Oshkosh Filter & Softener Co., 204 Ceape Ave., P. O. Box 137, Oshkosh, Wis.
Oster Mfg. Co., The, 1340 E. 289th St., Wickliffe, O.
OverHead Heaters Inc., 1612 Book Bldg., Detroit 26, Mich.
Owens Co., H., 9300 Venice Blvd., Culver City, Calif.
Owens & Co., Inc., Henry, 51 Washington Ave., Cranston 7, R. I.
Owens-Corning Fiberglas Corp., 717 Fifth Ave., New York 22, N. Y.
Oxy Catalyst, Inc., Wayne, Pa.
Oxygen Equipment & Service Co., 8335 S. Halsted St., Chicago 20.
Ozalid Div. of General Aniline & Film Corp., 1505 Ansco Rd., Johnson City, N. Y.

P

P-K Industries, Inc., 27 Porete Ave., North Arlington, N. J.
Pabco Industrial Insulations Div., Fibreboard Paper Products Corp., 475 Brannan St., San Francisco 19, Calif.
Pace Inc., R.M., 1339 N. Pennsylvania, Indianapolis 2, Ind.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pacific Lumber Co., The, 100 Bush St., San Francisco 4, Calif.
Pacific Pumping Co., 9201 San Leandro Blvd., Oakland, Calif.
Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.
Pacific Steel Boiler Div., National-U.S. Radiator Corp., 944 Ash St., Johnstown, Pa.
Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif.
Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.
Packard Electric Div., General Motors Corp., Warren, O.
Packard Water Conditioners, Inc., 1720 Prudential Bldg., Jacksonville, Fla.
Packless Metal Hose, Inc., 730-12 S. Columbus Ave., Mt Vernon, N. Y.
Page Steel & Wire, Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Co., 2 Westgate Rd., Addison, Ill.
Palmer Electric Co., Inc., 230 E. Alexandrine, Detroit 1, Mich
Palmer Fan Div., Palmer Engineering Co., P. O. Box 812, Green Bay, Wis.
Palmer Mfg. Corp., 2200 W. Fillmore St., Phoenix, Ariz.
Palmer-Shile Co., 16072 Fullerton, Detroit 27, Mich.
Palmer Thermometers, Inc., 2501 Norwood Ave., Cincinnati (Norwood) 12, O.
Pal-O-Pak Insulation Co., Inc., Hartland, Wis.
Pam Co., The, 1951 N. W. Wilson St., Portland, Ore.
Pam Narrow Fabrics Co., 2807 Long Beach Rd., Oceanside, N. Y.
Panel Heat, Inc., 1395 Marconi Blvd., Copiague, N. Y.
Pangborn Corp., 400 Pangborn Blvd., Hagerstown, Md.
Pantex Mfg. Corp., P. O. Box 660, Pawtucket, R. I.
Paragon Electric Co., 1609 Twelfth St., Two Rivers, Wis.
Paragon-Revolute Corp., 61 South Ave., Rochester 4, N. Y.
Parish Co., 3310 Burgundy St., New Orleans 17, La.
Parke-Hill Chemical Corp., 29 Bertel Ave., Mt. Vernon, N. Y.
Parker Boiler Mfg. Co., Sid E., 2035 E. 37th St., Los Angeles 58.
Parker Fittings & Hose Div. of Parker-Hannifin Corp., 17325 Euclid Ave., Cleveland 12.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Parker Seal Co., Div. of Parker-Hannifin Corp., 17325 Euclid Ave., Cleveland 12, O.
Parker Seal Co., 10567 Jefferson Blvd., Culver City, Calif.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Parsons Co., Div. of Koehring Co., 200 N. 8th Ave., E., Newton, Ia.
Partlow Corp., The, 203 Campion Rd., New Hartford, N. Y.
Patco Mfg. Co., Inc., 231 N. Bread St., Philadelphia, Pa.
Patrol Valve Co., The, 2310 Superior Ave., Cleveland 14, O.
Patten Co., J. V., Sycamore, Ill.
Patterson-Kelley Co., Inc., The, 465 Warren St., East Stroudsburg, Pa.
Paul-Lewis Laboratories, Inc., 4253 N. Port Washington Rd., Milwaukee 12, Wis.
Paul Valve Corp., 683 Third Ave., New York 17, N. Y.
Payne Company, 855 Anaheim Puente Rd., La Puente, Calif.
Peabody Engineering Corp., 232 Madison Ave., New York 16, N. Y.
Pease Co., C. F., The, 2601 W. Irving Park Rd., Chicago 18, Ill.
Peck Co., Cecil C., 14901 Woodworth Rd., Cleveland 10, O.
Peck, Stow & Wilcox Co., Center St., Southington, Conn.
Pecora Inc., 300-400 W. Sedgley Ave., Philadelphia 40, Pa.
Peden Equipment Co., 4512 Mt. Vernon, Houston, Tex.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40.
Pee Cee Tape & Label Co., 521 N. LaBrea, Los Angeles 36, Calif.
Peer, Inc., 1440 Milton St., Benton Harbor, Mich.
Peerless of America, Inc., 5800 N. Pulaski Rd., Chicago 46, Ill.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Peerless Mfg. Div., Dover Corp., P. O. Box 2015, Louisville 10, Ky.
Peerless Products Div., United Cooling Towers, Inc., 1421 E. Washington Ave., North Little Rock, Ark.
Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., 1242 Holden Ave., Detroit 3, Mich.
Penn Boiler Div., Pebbco Industries, Inc., Lancaster, Pa.
Penn Brass & Copper Co., 3800 W. 20th St., Erie, Pa.
Penn Controls, Inc., Goshen, Ind.
Penn Galvanizing Co., 2201 E. Tioga St., Philadelphia 34, Pa.
Penn Instruments Div. of Burgess-Manning Co., 4110 Haverford Ave., Philadelphia 4, Pa.
Penn Mfg. Corp. of Washington, Pa., 380 W. Chestnut St., P. O. Box 484, Washington, Pa.
Pennsalt Chemicals Corp., Three Penn Center, Philadelphia 2, Pa.
Penn Ventilator Co., 3252 Goodman, Philadelphia 40, Pa.
Pennsylvania Engineering Co., 1107-21 N. Howard St., Philadelphia 23, Pa.
Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42, Pa.
Pennsylvania Forge, Div. of Chemetron Corp., Milnor & Bleigh Sts., Philadelphia 35, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Perfect Circle Corp., Hagerstown, Ind.
Perfecting Service Co., 332 Atlando Ave., Charlotte 6, N. C.
Perfection Industries Div., Hupp Corp., 1135 Ivanhoe Rd., Cleveland 10, O.
Perfex Plastics, Inc., 2632 S. Dearborn, Chicago, Ill.
Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.
Permacel, New Brunswick, N. J.
Permatex Co., Inc., 300 Broadway, Huntington Sta., Long Island, N. Y.
Permatron Corp., 4840 N. Linder Ave., Chicago 30, Ill.
Permutit Co., The, Div. of Pfaudler Permutit, Inc., 50 W. 44th St., New York 36, N. Y.
Perolin Co., Inc., The, 350 Fifth Ave., New York 1, N. Y.
Pesco Products Div., Borg-Warner Corp., 24700 N. Miles Rd., Bedford, O.
Peters Co., The, Div. of Toledo Paint & Chemical Co., 33 Blucher St., Toledo, O.
Petersen Mfg. Co., DeWitt, Nebr.
Petro, 3170 W. 106th St., Cleveland 11, O.
Petroleum Solvents Corp., 9 East 45 St., New York 17, N. Y.
Petrometer Corp., 43-22 Tenth St., Long Island City 1, N. Y.
Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N. Y.
Phelps Mfg. Co., 715 Thomas St., Little Rock, Ark.
Pheoll Mfg. Co., Inc., 5700 Roosevelt Rd., Chicago 50, Ill.
Philadelphia Gear Corp., Erie Ave. & G St., Philadelphia 34, Pa.
Philadelphia Hoist Div., Industrial Enterprises, Inc., Doyle & N. Hamilton Sts., Doylestown, Pa.
Philadelphia Pipe Bending Co., 4135-65 N. Fifth St., Philadelphia 40.
Philadelphia Thermometer Co., 6th & Cayuga St.. Philadelphia 40, Pa.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Philips Electronics, Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.
Phillips & Co., H. A., 3255 W. Carroll Ave., Chicago 24, Ill.
Phillips Cooling Tower Co., Inc., 220 Dupont St., Brooklyn 22, N. Y.
Phillips Drill Co., U. S. No. 12 & Liberty Trail, Michigan City, Ind.
Phillips Impact Swedging Tool Co., 1237 N. E. 125th St., North Miami, Fla.
Phoenix Brass Fittings Corp., 354-378 Coit St., Irvington 11, N. J.
Phoenix Iron & Steel Co., Phoenix Steel Tube Div., Phoenixville, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Mfg. Co., Front & Chapel, Catasauqua, Pa.
Phoenix Products Co., 4715 N. 27th St., Milwaukee 16, Wis.
Photobell Co., Inc., 43 Vesey St., New York 7, N. Y.
Photomation, Inc., 96 S. Washington Ave., Bergenfield, N. J.
Pick Mfg. Co., West Bend, Wis.
Picker X-Ray Co., 25 S. Broadway, White Plains, N. Y.
Pickett & Eckel, Inc., 1109 S. Fremont, Alhambra, Calif.
Pierce Co., Wm. B., The, 277 Military Rd., Buffalo 7, N. Y.
Piezo Mfg. Corp., 250 Arlington Ave., Staten Island, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Pilot Mfg. Co., P. O. Box 2127, 20433 Earl St., Torrance, Calif.

Pines Engineering Co., Inc., 685 Walnut St., Aurora, Ill.
Pioneer Mfg. Co., 3131 San Fernando Rd., Los Angeles 65, Calif.
Pioneer Tool Co., 908 10th St., Racine, Wis.
Pipeline Coatings & Engineering Co., 5501 Santa Fe Ave., Los Angeles 58, Calif.
Pipe Line Development Co., 5700 Detroit Ave., Cleveland 2, O.
Pipe Plugs, Inc., Wellington, O.
Piper Industries, Inc., 15930 Common Rd., P. O. Box 456, Roseville, Mich.
Piping Specialties, Inc., 114 Liberty St., New York 6, N. Y.
Pittsburgh Brass Mfg. Co., 3155 Penn Ave., Pittsburgh 1, Pa.
Pittsburgh Coke & Chemical Co., Grant Bldg., Pittsburgh, Pa.
Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.
Pittsburgh Lectrodryer Div., McGraw-Edison Co., 327 32nd St., Pittsburgh 30, Pa.
Pittsburgh Nipple Wks., Inc., 1455 Spring Garden Ave., Pittsburgh 12.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pittsburgh 23, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Pittsburgh Piping & Equipment Co., 158 49th St., Pittsburgh 1, Pa.
Pittsburgh Plate Glass Co., 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa.
Pittsburgh Steel Co., 800 Grant Bldg., Pittsburgh, Pa.
Pittsburgh Tube Co., 212 Wood St., Pittsburgh 22, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsfield Products, Inc., 2275 Platt Rd., Ann Arbor, Mich.
Plant Engineering & Equipment Co., 110-120 Burnett St., Elizabeth, N. J.
Plant Equipment Div., General Blower Co., Inc., 6412 Girard Ave., Philadelphia 31, Pa.
Plasteel Products Corp., McAdam Ave., Washington, Pa.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7, N. Y.
Plastex Co., 3232 Cleveland Ave., Columbus 24, O.
Plastic Products Co., 6467 Georgia Ave., Detroit 11, Mich.
Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn.
Plasti-Foam Corp., 77 River St., Hoboken, N. J.
Plastiline, Inc., 2 Intervale St., White Plains, N. Y.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, 11200 Hindry Ave., Los Angeles 45, Calif.
Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.
Plicoflex, Inc., 5501 Santa Fe Ave., Los Angeles 58, Calif.
Plummer Mfg. Co., W. A., 752 So. San Pedro St., Los Angeles 14, Calif.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Poe Co., C. W., The, 10526 Wilbur Ave., Cleveland 6, O.
Pokorney Mfg. Co., 3117 Clybourn Ave., Chicago 18, Ill.
Pollen Ex Co., 303 W. Monroe, Chicago, Ill.
Polygon Plastic Co., Walkerton, Ind.
Polymer Corp., The, 2120 Fairmont Ave., Reading, Pa.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry, Baltimore 11, Md.
Porce-Lin Tank Lining Co., 456 Milwaukee, Detroit, Mich.
Porous Plastic Filter Co., Glen Cove, N. Y.
Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill.
Port City Machine & Tool Co., 3590 Airline Rd., Muskegon, Mich.
Porter-Cable Machine Co., 700 Marcellus St., Syracuse 4, N. Y.
Porter Co., Inc., H. K., Forge & Fittings Div., W-S Fittings Wks., Aldene Rd., P. O. Box 95, Roselle, N. J.
Porter Co., Inc., H. K., Peerless Electric Div., 1401 W. Market St., Warren, O.
Porter Co., Inc., H. K., Thermoid Div., Tacony & Comly Sts., Philadelphia 24, Pa.
Porter & Co., Inc., H. W., 825 Frelinghuysen Ave., Newark 12, N. J.
Porter Co., R. C., 8327 Newbury Rd., Cincinnati 42, O.
Portland Copper & Tank Works, Inc., 80 Second St., South Portland, Me.
Portmar Boiler Co., Inc., 193 Seventh St., Brooklyn 15, N. Y.
Posen & Kline Tube Co., Whitehall Rd., Norristown, Pa.
Potter & Brumfield, Princeton, Ind.
Potter Company, The, 1950 Sheridan Rd., North Chicago, Ill.
Potts-Farrington Co., 4250 Wissahickon Ave., Philadelphia 29, Pa.
Powell Co., Wm., The, 2525 Spring Grove Ave., Cincinnati 22, O.
Power Engineering Corp., 2504 Commercial, Mingo Jct., O.
Power-Flame Division Inc., Grandview, Mo.
Power Line Fan Co., Inc., Subsidiary of Chelsea Products, Inc., 639 S. Ave., Plainfield, N. J.
Power Strut, Inc., 13 Claflin St., Framingham, Mass.
Powers Regulator Co., 3459 Oakton St., Skokie 6, Ill.
Pratt Co., Henry, 319 W. Van Buren St., Chicago, Ill.
Precision Fan Blade Mfg. Co., Div. of Warrington Co., 4871 San Fernando Rd., West, Los Angeles 39, Calif.
Precision Parts Corp., 400 N. First St., Nashville 7, Tenn.
Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30, Pa.
Precision Welder Mfg. Co., 2218 W. Lake St., Chicago 12, Ill.
Preferred Utilities Mfg. Corp., 41 E. 42 St., New York 17, N. Y.
Preis Engraving Machine Co., H. P., 661 U. S. Highway #22, Hillside, N. J.
Premier Co., 755 Woodlawn Ave., St. Paul 1, Minn.
Prepo Corp., Edgerton, Wis.
Presstite Div., American-Marietta Co., 3900 Chouteau Ave., St. Louis 10, Mo.
Pressure Airduct Corp., 8130 N. St. Louis, Skokie, Ill.
Price Brothers, E. Monument Ave., Dayton, O.
Price Pump Co., E. L., Box 357, Sonoma, Calif.
Prier Brass Mfg. Co., 7801 Truman Rd., Kansas City 22, Mo.
Pritchard & Co. of California, J. F., 4625 Roanoke Parkway, Kansas City 12, Mo.
Process Engineering, Inc., Foot of Chase St., Methuen, Mass.
Procon Pump & Engineering Co., 12721 Capital Ave., Oak Park 37, Mich.
Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.
Product Engineering, 9703 South West Highway, Oak Lawn, Ill.
Production Stamping Co., 2316 S. 24th St., Omaha, Nebr.
Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.
Propellair Div., Robbins & Myers Inc., 1345 Lagonda Ave., Springfield, O.
Protection Controls, Inc., 7317 N. Lawndale Ave., Skokie, Ill.
Protective Closures Co., Inc., Caplugs Div., 2207 Elmwood Ave., Buffalo 22, N. Y.
Protokap, Inc., 625 West Building, Houston, Tex.
Proto Tool Co., Div. of Pendleton Tool Industries, Inc., 2209 Santa Fe Ave., Los Angeles, Calif.
Prox Company, Inc., Frank, 1201 S. First St., Terre Haute, Ind.
Pudlo Liquid Filters, Inc., New Holstein, Wis.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis 20.
Pullman Vacuum Cleaner Co., 25 Buick St., Boston 15, Mass.
Pulverizing Machinery Div., Metals Disintegrating Co., Inc., 96 Chatham Rd., Summit, N. J.
Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., 150 E. 42nd St., New York 17, N. Y.
Puritron Corp., 15 Stiles St., New Haven, Conn.
Purolator Products, Inc., 970 New Brunswick Ave., Rahway, N. J.
Pyle-National Co., The, 1373 N. Kostner Ave., Chicago 51, Ill.
Pyott Foundry & Machine Co., 140 Stone St., Aurora, Ill.
Pyramid Industries, Inc., 1422 Irwin Dr., Erie, Pa.
Pyramid Instrument Corp., 630 Merrick Rd., Lynbrook, Long Island, N. Y.
Pyramid Plastics, Inc., 554 W. Polk St., Chicago, Ill.
Pyrne & Co., Inc., 140 N. Towne Ave., Pomona, Calif.
Pyrodyne, Inc., P. O. Box 49972, Los Angeles 49, Calif.
Pyrolite Products Co., 1221-1231 W. 74th St., Cleveland 2, O.
Pyrometer Instrument Co., Inc., Bergenfield, N. J.

Q

Q-P Mfg. Co., Needham Heights, Mass.
Quaid Fabrications, Inc., State Highway 73, Palmyra, N. J.
Quaker City Iron Wks., Allegheny & Tulip St., Philadelphia 34, Pa.
Quality Specialty Co., Inc., 28th & Lincoln Ave., Camden 5, N. J.
Quartz Products Corp., 688 Somerset St., P. O. Box 628, Plainfield, N. J.
Quelcor, Inc., Front & Broomall Sts., Chester, Pa.
Queen City Engineering Co., Old Pineville Rd., P. O. Box 3103, Charlotte, N. C.
Quickdraft Co., Dueber-Hampden Bldg., P. O. Box 87-K, Canton, O.
Quick Plastics, 1680 Cooper St., Jackson, Mich.
Quickwork Div., Whiting Corp., Harvey, Ill.
Quiet Automatic Oil Burners Corp., 33 Bloomfield Ave., Newark 4, N. J.
Quigley Co., Inc., 415 Madison Ave., New York 17, N. Y.

R

R C S Tool Corp., 227-229 East Front St., P. O. Box 661, Bloomington, Ill.
R. I. Humidifier & Ventilating Co., Inc., 65 Lansdowne St., Cambridge 39, Mass.
R.K.L. Valve & Mfg. Co., Route 38 & Rudderow Ave., Maple Shade, N. J.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading Pa.
R & R Metal Products, Inc., 11622 S. Western Ave., Chicago 43, Ill.
Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Radiant Devices, 4030 Chouteau Ave., St. Louis, Mo.
Radiant Electric Heat Co., P. O. Box 141, 2515 South Grand — East, Springfield, Ill.
Radiant Heat & Cooling Co., 795 Kifer Rd., Santa Clara, Calif.
Radiant Panel Mfg. Co., 9 E. Pearl St., Torrington, Conn.
Radiant-Ray Radiation, Inc., 464 Hartford Ave., Newington, Conn.
Radiant Utilities Corp., 8817-18th Ave., Brooklyn 14, N. Y.
Radiator Specialty Co., 1700-1900 Dowd Rd., Charlotte 1, N. C.
Radio Corp. of America, RCA Victor Div., Front & Cooper, Camden, N. J.
Radio Corp. of America, Industrial Electronic Products, Camden, N. J.
Raisler Corp., Grimes Sprinkler Div., 750 Third Ave., New York 17.
Ramco Equipment Corp., 1373 Lafayette Ave., New York 59, N. Y.
Ramco Mfg. and Engineering Co., 5413 N. E. Columbia Blvd., Portland, Ore.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., 289 Winchester Ave., New Haven 4, Conn.
Ramsey Products Corp., Broadway, Albany 4, N. Y.
Ramtite Co., The, 2563 W. 18th St., Chicago 8, Ill.
Ranco Incorporated, 601 W. 5th Ave., Columbus 1, O.
Randall Graphite Bearings, Inc., Greenlawn & Lake Sts., Lima, O.
Randolph-Page, Inc., 175 Fifth Ave., New York 10, N. Y.
Ransburg Electro-Coating Corp., P. O. Box 23122, Indianapolis 23, Ind.
Ransome Torch & Burner Co., 4030 Hollis St., Emeryville, Calif.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Ravena Iron Co., Ravena, N. Y.
Rawlplug Co., Inc., The, 200 Petersville Rd., New Rochelle, N. Y.
Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif.
Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Rayfield-Staffco Burner Co., 2066 Canalport, Chicago 8, Ill.

Raymanco Mfg. Co., 118 West Rose St., Owatonna, Minn.
Raymond Div., Combustion Engineering, Inc., 1324 N. Branch St., Chicago, Ill.
Raypak Co., Inc., 2416 Chico Ave., El Monte, Calif.
Reading Tube Corp., 350 - 5th Ave., New York, N. Y.
Ready-Power Co., The, 11231 Freud Ave., Detroit 14, Mich.
Reco Products Div., Recony Corp., 150 Nassau St., New York 38, N. Y.
Recold Corp., 7250 E. Slauson Ave., Los Angeles 22, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rector Mineral Trading Corp., 551 Fifth Ave., New York 17, N. Y.
Rectorseal Div., Rector Well Equipment Co., 2215 Commerce St., Houston 2, Tex.
Red Jacket Co., Inc., 513 Bell Ave., Carnegie, Pa.
Red Jacket Mfg. Co., 1051 S. Rolff St., Davenport, Ia.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Redi-Bolt, Inc., 5334 Indianapolis Blvd., East Chicago, Ind.
Redmanson Corp., 630 Loucks Mill Rd., York, Pa.
Redmond Co., Inc., Owosso, Mich.
Reed Mfg. Co., 1425 W. 8th St., Erie, Pa.
Reed Unit-Fans, Inc., 501 N. St. Patrick St., New Orleans 19, La.
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Reeves Steel & Mfg. Co., Div. of Empire-Reeves Steel Corp., Dover, O.
Reflectal Corp., Subsid., Borg-Warner Corp., 200 S. Michigan Ave., Chicago 4, Ill.
Reflectotherm, Inc., 26 East University Ave., Cincinnati 19, O.
Reflin Co., 5660 Kearney Villa Rd., San Diego 11, Calif.
Refractory & Insulation Corp., 120 Wall St., New York 5, N. Y.
Refrigerating Specialties Co., 3004 W. Lexington St., Chicago, Ill.
Refrigeration Appliances, Inc., 917-923 W. Lake St., Chicago, Ill.
Refrigeration Devices Co., 51 E. Centre St., Nutley 10, N. J.
Refrigeration Research, Inc., 9901 East Grand River, Brighton, Mich.
Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 20, N. Y.
Regent Engineering Co., 336 Potter Rd., Wood Dale, Ill.
Register & Grille Mfg. Co., Inc., 698 Manhattan Ave., Brooklyn 22, N. Y.
Reichert Float & Mfg. Co., 2242 Smead Ave., Toledo 6, O.
Reid Controls, Inc., 2021 N. Lincoln, Burbank, Calif.
Reif-Rexoil, Inc., 37-41 Carroll St., Buffalo 3, N. Y.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4, Ind.
Reiner & Campbell Co., Inc., 19 Euclid Ave., P. O. Box 5035, Newark 5, N. J.
Reintjes Co., Geo. P., 2517-19 Jefferson St., Kansas City, Mo.
Reliable Products Mfg. Co., Inc., 123 DeKalb Ave., Brooklyn 17, N. Y.
Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland 3, O.
Reliance Instrument Mfg. Corp., 190 Glen Cove Ave., Glen Cove, Long Island, N. Y.
Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago, Ill.
Relton Corp., 99 N. Lotus Ave., P. O. Box 5546, Pasadena, Calif.
Remco, Inc., Zelienople, Pa.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn.
Rempe Co., 342 N. Sacramento Blvd., Chicago 12, Ill.
Rentip, Inc., R.R. No. 4, Osborne Rd., Knoxville, Tenn.
Reproduction Engineering Corp., Essex, Conn.
Republic Appliance Corp., 4901 S. Boyle, Los Angeles 58, Calif.
Republic Flow Meters Co., Subsid. of Rockwell Mfg. Co., 2240 Diversey Pkwy., Chicago 47, Ill.
Republic Mfg. Co., 15655 Brookpark Rd., Cleveland 35, O.
Republic Products Co., 7420 State Rd., Philadelphia 36, Pa.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown 1, O.
Republic Steel Corp., Republic Bldg., Cleveland 1, O.
Research Appliance Co., Rt. 8 at Craighead Rd., Box 307, Allison Park, Pa.
Research-Cottrell, Inc., Bound Brook, N.J.
Research Products Corp., 1015 E. Washington Ave., Madison 1, Wis.
Research Vacuum Supply Co., 6712 N. Clark St., Chicago 26, Ill.
Resisto Pipe & Valve Co., 262 Bridge St., East Cambridge, Mass.
Resistoflex Corp., Roseland, N. J.
Resolite Corp., Zelienople, Pa.
Reuland Electric Co., 3001 W. Mission Rd., Alhambra, Calif.
Revcor Inc., Carpentersville, Ill.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Revere Copper & Brass, Inc., Foil Div., 196 Diamond St., Brooklyn 22, N. Y.
Rex Clay Products Co., 7717 Lyndon, Detroit 38, Mich.
Rex Roto Corp., 1109 Decker Rd., Walled Lake, Mich.
Rex Welder Company, 1200-1248 Milton St., Benton Harbor, Mich.
Reynolds Electric Co., 3000 River Rd., River Grove, Ill.
Reynolds Mfg. Co., The, Box 333, Comstock Park, Mich.
Reynolds Metals Co., West Broad St., Richmond 18, Va.
Reynolds Ventilator Mfg. Corp., 7530 N. Sheridan Rd., Chicago 26, Ill.
Reynolds Water Conditioning Co., 12100 Cloverdale Ave., Detroit 4, Mich.
Reznor Mfg. Co., 51 Union St., Mercer 8, Pa.
Rheem Mfg. Co., 7600 Kedzie Ave., Chicago 52, Ill.
Rhoads Engineering Corp., 9063 Washington Blvd., Culver City, Calif.
Rhoads & Sons, J. E., 2100 W. 11th St., Wilmington 99, Del.
Rhode Island Fittings Co., 355 Dexter St., Providence 7, R. I.
Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Rhopac, Inc., 3425 Cleveland St., Skokie, Ill.
Rich Mfg. Co. of California, 3851 Santa Fe Ave., Los Angeles 58, Calif.
Richkraft Co., 510 N. Dearborn, Chicago, Ill.
Richmond Engineering Co., 7th and Hospital Sts., Richmond, Va.
Richmond Plumbing Fixtures Div., Rheem Mfg. Co., Box 111, Metuchen, N. J.
Richmont, Inc., 922 S. Myrtle Ave., Monrovia, Calif.
Richo Plastic Co., 4445 West Fullerton Ave., Chicago 39, Ill.
Ric-wiL, Inc., Barberton, O.
Ridge Tool Co., Clark St., Elyria, O.
Riggio Co., Inc., Frank D., State Highway 17, Rutherford, N. J.
Rigidbilt Inc., 9240 Belmont Ave., Franklin Park, Ill.
Rigidized Metals Corp., 721 Ohio St., Buffalo 3, N. Y.
Riley Stoker Corp., 9 Neponset St., Worcester, Mass.
Rinehart Inc., 511-513 Main St., Richmond, Ind.
Ripley Co., Inc., Middletown, Conn.
Rite Engineering & Mfg. Corp., 9441 Washburn Crossing Rd., Downey, Calif.
Ritter Pattern & Casting Co., Inc., 120 Walker St., New York 13, N. Y.
Rittling Corp., The, Rittling Bldg., Buffalo 5, N. Y.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
Roberson, Inc., 1539 E. 103rd St., Seattle 55, Wash.
Robert Mfg. Co., 9035 Venice Blvd., Los Angeles 34, Calif.
Roberts-Gordon Appliance Corp., 44 Central Ave., Buffalo 6, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., 6100 Ranspach Ave., Detroit, Mich.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.
Robinair Mfg. Corp., Edgerton, O.
Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N. J.
Robinson Clay Product Co., The, 65 W. State St., Akron 9, O.
Robinson Industries, Coleman, Mich.
Robinson Ventilating Co., Zelienople, Pa.
Robvon Backing Ring Co., 675 Garden St., Elizabeth 2, N. J.
Rochester Lead Works, Inc., 380 Exchange St., Rochester 8, N. Y.
Rochester Mfg. Co., Inc., 63 Rockwood St., Rochester 10, N. Y.
Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill.
Rockford Brass Works, 700 S. Main, Rockford, Ill.
Rockford Screw Products Co., 2501 Ninth St., Rockford, Ill.
Rockwell Co., W. S., 200 Eliot St., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., 400 N. Lexington Ave., Pittsburgh 8, Pa.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Roddick Tool Co., P. O. Box 109, Anaheim, Calif.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg, Pittsburgh 15, Pa.
Roll-Weld Pipe & Tube, Inc., 2961 Old Kings Rd., P. O. Box 1234, Jacksonville, Fla.
Roller Bearing Co. of America, Sullivan Way, West Trenton, N. J.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Romla Co., 13101 S. Main St., Los Angeles 61, Calif.
Ronningen-Petter Co., 330 S. 27th St., Vicksburg, Mich.
Roots-Connersville Blower, Div. of Dresser Industries, Inc., 900 W. Mount St., Connersville, Ind.
Roper Hydraulics, Inc., 340 Blackhawk Park Ave., Rockford, Ill.
Rosebraugh Co., W. W., P. O. Box 2008, 680 17th St., S. E., Salem, Ore.
Ross Engineering Div., J. O., Midland-Ross Corp., 730 Third Ave., New York 17, N. Y.
Ross Sprinkler Co., 4333 Temple City Blvd., Rosemead, Calif.
Ross Valve Mfg. Co., Inc., 6 Oakwood Ave., Troy, N. Y.
Rotary Concrete Drill Co., 650 S. Arroyo Pkwy., Pasadena, Calif.
Rotary Seal Div., Muskegon Piston Ring Co., 2020 N. Larrabee St., Chicago 14, Ill.
Roth Co., Roy E., 2420-A 24th Ave., Rock Island, Ill.
Rotherm Engineering Co., Inc., 7280 W. Devon, Chicago, Ill.
Rotometals, 980 Harrison St., San Francisco 7, Calif.
Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 32, O.
Rotron Controls Corp., Woodstock, N. Y.
Round Oak Co., Inc., Dowagiac, Mich.
Royalton Co., Inc., Gasport, N. Y.
Royco Instruments, 365 San Antonio Rd., Mountain View, Calif.
Royersford Foundry & Machine Co., Inc., 101-131 Main St., Royersford, Pa.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.
Rubber & Plastics Compound Co., 10 Rockefeller Plaza, New York 20, N. Y.
Ruberoid Co., 500 Fifth Ave., New York 36, N. Y.
Ruby Chemical Co., 68-70 McDowell St., P. O. Box 1108, Columbus 16, O.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12, Wis.
Ruggles Klingemann Mfg. Co., 110 Tremont St., Boston, Mass.
Ruppright's Rotary Roof Cooler, Box 43555, Los Angeles 43, Calif.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Russell Co., F. C., The, Box 26, Columbiana, O.
Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, O.
Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill.
Ruthman Machinery Co., 1809 Reading Rd., Cincinnati 2, O.
Rutland Fire Clay Co., Curtis Ave., Rutland, Vt.
Ruud Mfg. Co., Kalamazoo, Mich.
Ryerson & Son, Inc., Joseph T., 2558 W. 16th, Chicago, Ill.

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S&C Mfg. Co., 6245 Wiehe Rd., Cincinnati, O.
SKF Industries, Inc., Front St. & Erie Ave., Philadelphia 32, Pa.
S.O.S. Products Co., Inc., 346 Cumberland St., Brooklyn 38, N. Y.
Sac Tool Mfg. Co., 1913 Washington Ave., St. Louis 3, Mo.
Safety Electrical Equipment Corp., 1187 Dixwell Ave., New Haven 14, Conn.
St. Clair Rubber Co., 440 E. Jefferson, Detroit, Mich.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., 1948 N. 9th St., St. Louis 6.
St. Louis Tool Co., 6100 Prescott St., St. Louis 15, Mo.
St. Paul Corrugating Co., S. Wabasha and Water Sts., St. Paul 1, Minn.

St. Piere Chain Corp., 50 Frank St., Worcester, Mass.
Sales & Co., Murray W., 801 W. Baltimore Ave., Detroit 2, Mich.
Salina Metal Products Co., 9th and Bishop, Salina, Kan.
Sall Bros. Co., 2320 Kishwaukee St., Rockford, Ill.
Salsbury Corp., 1161 E. Florence Ave., Los Angeles 1, Calif.
Salton Mfg. Co., Inc., 519 E. 72nd St., New York 21, N. Y.
Sampson Scientific Co., Div. of the Sampson Chemical & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill.
San Angelo Foundry & Machine Co., P. O. Box 1152, San Angelo, Tex.
Sandee Mfg. Co., 5050 W. Foster Ave., Chicago 30, Ill.
Sandstrom Products Co., Port Byron, Ill.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale 20, Mich.
Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.
Sarcotherm Controls, Inc., 635 Madison Ave., New York 22, N. Y.
Sargent Enginairing Co., 1375 E. 45th St., Cleveland 3, O.
Sauereisen Cements Co., 1045 North Canal St., Pittsburgh 15, Pa.
Saunders Mfg. Co., 25 Atherton St., Yonkers, N. Y.
Saussé & Co., M. W., 636 N. Robertson Blvd., Los Angeles 46, Calif.
Saverite Engineering Co., 158 - 14th St., Hoboken, N. J.
Sawhill Tubular Products, Inc., P. O. Box 11, Sharon, Pa.
Scaico Controls Inc., P. O. Box 41, Cooper St., Delanco, N. J.
Scaife Co., 26 Ann St., Oakmont, Pa.
Schade Valve Mfg. Co., 2527 N. Bodine St., Philadelphia 33, Pa.
Schaevitz Engineering, P. O. Box 505, Camden 1, N. J.
Schaible Co., The, 5801 Mariemont Ave., Mariemont 27, O.
Scharer & Co., Ray A., 17411 E. Warren, Detroit 24, Mich.
Scharf Mfg. Co., J. H., 6120 Binney St., Omaha, Nebr.
Schatz Mfg. Co., The, Fairview, Poughkeepsie, N. Y.
Schaub Engineering Co., Fred H., 2110 S. Marshall Blvd., Chicago 23, Ill.
Schaul Mfg. Co., 6300 Rowland Ave., Cleveland 27, O.
Schemenauer Mfg. Corp., Holland, O.
Schick Products, Inc., P. O. Box 867, Belmont, Calif.
Schieren Co., Chas. A., 1300 Walnut St., Camden 3, N. J.
Schlegel Mfg. Co., 1555 Jefferson Rd., P. O. Box 197, Rochester 1, N. Y.
Schild Mfg. Co., P. O. Box 412, Beaver Dam, Wis.
Schmieg Industries, Inc., P. O. Box 4701, Detroit 34, Mich.
Schnacke, Inc., 1101 N. Governor St., Evansville, Ind.
Schneible Co., Claude B., P. O. Box 296, Roosevelt Pk. Annex, Detroit 32, Mich.
Schoedinger, Inc., F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.
Schramm, Inc., West Chester, Pa.
Schroeder Brothers Corp., Nichol Ave., P. O. Box 72, McKees Rocks, Pa.
Schurs Oil Burner Co., 8500 Zamore Ave., Los Angeles 1, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Schwartz Chemical Co., Inc., 50-01 2nd St., Long Island City 1, N. Y.
Schwitzer Corp., 1125 Massachusetts Ave., Indianapolis 7, Ind.
Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.
Scientific Instrument Co., 617 Howard St., Detroit 26, Mich.
Scott, Inc., H. H., Inst. Div., 111 Powder Mill Rd., Maynard, Mass.
Scott Paper Co., Chester, Pa.
Scott Valve Mfg. Co., 3963 McKinley Ave., Detroit 8, Mich.
Scovill Mfg. Co., 99 Mill St., Waterbury 20, Conn.
Scully Signal Co., 174 Green St., Melrose 76, Mass.
Sealed Power Corp., 2001 Sanford St., Muskegon 61, Mich.
Sealed Unit Parts Co., Inc., 1178 E. 180th St., New York 60, N. Y.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., 47 Ridgeway Ave., Aurora, Ill.
Sealol Corp., Warwick Industrial Park, Providence 5, R. I.
Seamless Rubber Co., The, Industrial Tape Div., 464 Congress Ave., New Haven 3, Conn.
Seamlex Co., Inc., 41-23 24th St., Long Island City 1, N. Y.
Seamon Snap Valve Co., Jct. Rt. 9 & 30, Boston & Worcester Turnpike, Westboro, Mass.
Security Valves Corp., 909 El Centro, South Pasadena, Calif.
Seelye Craftsmen, Inc., 984 Central Ave., Minneapolis 13, Minn.
Seiberling Rubber Co., Plastics Div., Newcomerstown, O.
Selas Corp. of America, Dresher 5, Pa.
SelecTemp Div., Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, O.
Self Cleaning Strainer Co., 4545 Southwest Highway, Oak Lawn, Ill.
Sellers Engineering Co., 4874-76 N. Clark St., Chicago 40, Ill.
Sellers Injector Corp., 1606 Hamilton St., Philadelphia 30, Pa.
Semet-Solvay Engineering Div., Allied Chemical Corp., 40 Rector St., New York 6, N. Y.
Senna Mfg. Co., 732 N. Napa St., Spokane 24, Wash.
Senrac Industries, Applegate Rd., Madison, Wis.
Serdex, Inc., 12 Bowdoin Square, Boston 14, Mass.
Sethco Mfg. Corp., 2284 Babylon Turnpike, Merrick, N. Y.
Seton Name Plate Co., 50-B Fitch St., New Haven 15, Conn.
Sette Products Co., 1241 High St., Oakland 1, Calif.
Sexauer Mfg. Co., Inc., J. A., Dept. 19, 2503-05 3rd Ave., New York 51, N. Y.
Shafer Bearing, Div. of Chain Belt Co., P. O. Box 57, Curtiss & Belmont, Downers Grove, Ill.
Shahmoon Industries, Inc., Warren Foundry & Pipe Div., 55 Liberty St., New York 5, N Y.
Shakeproof Div., Illinois Tool Wks., St. Charles Rd., Elgin, Ill.
Shallcross Controls, Inc., P. O. Box 497, Markesan, Wis.
Shank Co., Cyrus, 4646 W. 12th Pl., Chicago 50, Ill.
Sharon Steel Corp., Sharon, Pa.
Shaw Co., Benjamin F., Second & Lombard Sts., Wilmington 99, Del.
Shaw-Kendall Engineering Co., 128 S. Superior St., Toledo 4, O.
Shaw-Perkins Mfg. Co., 201 E. Carson St., Pittsburgh 19, Pa.
Sheldon & Co., Inc., M. L., 350 Lexington Ave., New York 16, N. Y.
Sheldon Equipment Co., E. H., 716 Nims St., Muskegon, Mich.
Shell Oil Co., Lubricants Dept., 41-70 Main St., Flushing 55, N. Y.
Shenango Refractories, Box 120, New Castle, Pa.
Sherwin-Williams Co., The, 101 Prospect Ave., N. W., Cleveland, O.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Shutt Process Equipment Corp., 1421 Norman Place, St. Louis 22, Mo.
Siebring Mfg. Co., George, Ia.
Sier Bath Gear & Pump Co., Inc., 9261 Hudson Blvd., North Bergen, N. J.
Sight Feed Generator Co., P. O. Box 38, West Alexandria, O.
Signet Controls, 3205 S. E. 13th Ave., Portland 2, Ore.
Sikes Co., S. R., 1028 S. Third St., Minneapolis 15, Minn.
Silence, Inc., 130 Main St., Farmingdale, N. Y.
Silent Automatic Products, 3121 W. 106th St., Cleveland 11, O.
Silent Glow Oil Burner Co., 850 Windsor St., Hartford, Conn.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11, Ill.
Silvercraft, Inc., 627 Bergman, Louisville, Ky.
Simplaire, 521 Fifth Ave., New York 17, N. Y.
Simplex Ceiling Corp., 552 W. 52nd St., New York 19, N. Y.
Simplex Mfg. Co., 198 N. Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 7901 Oxford, Philadelphia 11, Pa.
Simplex Valve & Meter Co., 7 E. Orange St., Lancaster, Pa.
Simpson Electric Co., 5208 W. Kinzie, Chicago, Ill.
Sims Co., 18th & Whitley Sts., Erie, Pa.
Sims Pump Valve Co., 1314 Park Ave., Hoboken, N. J.
Sinclair-Collins Valve Co., 454 Morgan Ave., Akron 11, O.
Sioux Steel Co., P. O. Box 898, Sioux Falls, S. D.
Sipe & Co., James B., Box 8010, Pittsburgh 16, Pa.
Sirod Corp., 1263 N. 70th St., Milwaukee 13, Wis.
Skidmore Corp., P. O. Box 309, St. Joseph, Mich.
Skil Corp., 5033 Elston Ave., Chicago 30, Ill.
Skinner Co., M. B., 3502 W. Sample, South Bend 21, Ind.
Skinner Electric Valve Div., The Skinner Chuck Co., Edgewood Ave., New Britain, Conn.
Skinner Engine Co., 337 W. 12th St., Erie, Pa.
Skinner Irrigation Co., 121 E. Canal St., Troy, O.
Skuttle Mfg. Co., Milford, Mich.
Skyline Industries Sales, Inc., Titusville, Pa.
Slant-Fin Radiator Corp., 130-15 89th Rd., Richmond Hill 18, N. Y.
Sloane Mfg. Co., 7606 No. Clybourn Ave., Sun Valley, Calif.
Sly Mfg. Co., W. W., 4700 Train Ave., P. O. Box 5939, Cleveland 1, O.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith-Blair, Inc., 535 Railroad Ave., S. San Francisco, Calif.
Smith Bros. Co., 414 S. Harvey, Oak Park, Ill.
Smith Chemical Co., E. W., 15020 E. Proctor Ave., La Puente, Calif.
Smithco Engineering, Inc., Cooling Tower Div., 3401 W. 11th St., P. O. Box 7264, Houston, Tex.
Smith Co., Inc., H. B., The, 57 Main St., Westfield, Mass.
Smith Co., J. B., 3327 B St., Philadelphia 34, Pa.
Smith Co., S. Morgan, Lincoln & Hartley Sts., York, Pa.
Smith Corp., A. O., 3533 N. 27th St., Milwaukee 1, Wis.
Smith Corp., A. O., Electric Motor Div., 531 No. 4th St., Tipp City, O.
Smith Corp., A. O., Permaglas Div., Kankakee, Ill.
Smith Filter Corp., 1603-2nd Ave., Moline, Ill.
Smith & Kanzler Corp., E. Linden Ave., Linden, N. J.
Smith Products Co., 43642 Nine Mile Rd., Northville 1, Mich.
Smith Twin Tubular Boiler Co., Inc., Cottman St. at State Rd., Philadelphia 35, Pa.
Smith Welding Equipment Corp., 2619 S. E. Fourth St., Minneapolis 14, Minn.
Smolensky Valve Co., 940 Broadway, Bedford, O.
Smooth-On Mfg. Co., 568-574 Communipaw Ave., Jersey City 4, N. J.
Snap-on Tools Corp., Kenosha, Wis.
Snap-Tite, Inc., 201 Titusville Rd., Union City, Pa.
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill.
Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif.
Soldering Specialties Co., 19 Chatham Rd., Summit, N. J.
Solfo Paint Mfg. Co., Trenton 3, N. J.
Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.
Solvent Service, Inc., P. O. Box 228, Painesville, O.
Somers Corp., 6063 Wabash Ave., Detroit 8, Mich.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Sonneborn Sons, Inc., L., Building Products Div., 404 Fourth Ave., New York 16, N. Y.
Sonner Burner Co., 412-420 E. 6th Ave., Winfield, Kans.
Sonoco Products Co., Construction Products Div., Hartsville, S. C.
Sostman & Co., H. E., 347 E. Lincoln Ave., Cranford, N. J.
Sound Reduction Corp., 133 Pitkin St., East Hartford, Conn.
South Bend Air Products, Inc., 415 S. Saint Joseph St., South Bend 1, Ind.
South Chester Corp., Southco Div., Lester, Pa.
South Chester Tube Co., Finance Bldg., Philadelphia 2, Pa.
Southern Name Plate Shop, 4601 Lafaye St., New Orleans 22, La.
Southern Pipe Div. of U. S. Industries, Inc., P. O. Box C, Azusa, Calif.
Southern Plastics Co., 408 Pendleton, Columbia, S. C.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwestern Plastic Pipe Co., P. O. Box 117, Mineral Wells, Tex.
Southworth Machine Co., 30 Warren Ave., Portland, Me.
Spanco Brass Sales, 1228 M-89 East, Allegan, Mich.
Sparkler Mfg. Co., Mundelein, Ill.
Sparkler-Filtrion Corp., 24th and Commonwealth, North Chicago, Ill.
Spartan Electric Radiator Corp., 52-55 74th St., Maspeth 78, N. Y.
Spartan Tool Div., H. D. Conkey & Co., 1918 Columbia Ave., Chicago 26, Ill.
Sparton Corp., 2301 E. Michigan, Jackson, Mich.
Special Chemicals Corp., 100 S. Water St., Ossining, N. Y.
Special Screw Products, Box 391, Bedford, O.
Speco, Inc., 7308 Associate Ave., Cleveland 9, O.
Speedline Fittings Div., Horace T. Potts Co., Erie Ave. & "D" St., Philadelphia 34, Pa.
Speed Selector Inc., P. O. Box 312, Chagrin Falls, O.

Speedway Mfg. Co., Div. of Thor Power Tool Co., 1421 Barnsdale, LaGrange Park, Ill.
Speed-Seam Co., 820 N. Walcott, Chicago 22, Ill.
Spence Engineering Co., Inc., 32 Grant St., Walden, N. Y.
Spencer Heater, Lycoming Div., Avco Corp., 652 Oliver St., Williamsport, Pa.
Spencer Turbine Co., 486 New Park Ave., Hartford 6, Conn.
Sperti Faraday, Inc., 1322 E. Church St., Adrian, Mich.
Sperti Faraday, Inc., 720 Grand St., Hoboken, N. J.
Spincraft, Inc., 4158-L W. State St., Milwaukee, Wis.
Spindler & Sons, Inc., August, Mercer St., Jersey City 2, N. J.
Sporlan Valve Co., 7525 Sussex Ave., St. Louis 17, Mo.
Sprague Electric Co., Marshall St., North Adams, Mass.
Spray Engineering Co., 100 Cambridge St., Burlington, Mass.
Spraying Systems Co., 3219 Randolph St., Bellwood, Ill.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago 18, Ill.
Spring Packing Corp., 332 S. Michigan Ave., Chicago, Ill.
Springfield Boiler Co., 1939 E. Capitol Ave., Springfield, Ill.
Springload Mfg. Corp., 6332 Maynard Ave., Seattle 8, Wash.
Sprout, Waldron & Co., Inc., Muncy, Pa.
Spurgeon Co., 23501 Hoover Rd., Warren, Mich.
Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.
Squires Co., C. E., The, 18502 Syracuse Ave., Cleveland 10, O.
Stainless Processing Div., Wall Colmonoy Corp., 19345 John R St., Detroit, Mich.
Stalwart Rubber Co., The, 381 Northfield Rd., Bedford, O.
Stamco Inc., New Bremen O.
Stanat Mfg. Co., Inc., 536 Shames Dr., Westbury, N. Y.
Standard Asbestos Mfg. Co., 860 W. Evergreen Ave., Chicago 22, Ill.
Standard Electric Mfg. Co., West Berlin, N. J.
Standard Engineering Wks., 289 Roosevelt Ave., Pawtucket, R. I.
Standard Fuel Engineering Co., 667 Post Ave., S., Detroit 17, Mich.
Standard Instrument Div., Heat Timer Corp., 657 Broadway, New York 1, N. Y.
Standard Machine & Mfg. Co., 704 East Big Bend Blvd., St. Louis 22.
Standard Oil Co. of California, 225 Bush St., San Francisco, Calif.
Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.
Standard Pressed Steel Co., Box 810, Jenkintown, Pa.
Standard Refrigeration Co., 3535 W. Fillmore St., Chicago 24, Ill.
Standard Stamping & Perforating Co., 3151 W. 49th Pl., Chicago 32, Ill.
Standard Tube Co., The, 24400 Plymouth Rd., Detroit 39, Mich.
Stanley Electric Tools Div., Stanley Works, 195 Lake St., New Britain, Conn.
Staples & Pfeiffer, 528 Bryant St., San Francisco 7, Calif.
Sta-Rite Products, Inc., 305 S. 8th St., Delavan, Wis.
Starbuck & Sons, Inc., R. M., Box 1318, Hartford 1, Conn.
Star Expansion Industries Corp., Mountainville, N. Y.
Starline Co., 119 Franklin Ave., Dayton, O.
Star Stainless Screw Co., 646 Union Blvd., Paterson 2, N. J.
Star Tubular Products Co., 4747 S. Richmond St., Chicago 32, Ill.
Star Woolen Co., Cohoes, N. Y.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stearns Co., N. C., P. O. Box 1234, Shreveport, La.
Stedco Products, 71 Lehigh St., Wilkes-Barre, Pa.
Steel City Electric Co., 1207 Columbus Ave., Pittsburgh, Pa.
Steelcote Mfg. Co., 3418 Gratiot St., St. Louis, Mo.
Steel Improvement & Forge Co., The, 970 E. 64th St., Cleveland 3, O.
Steffan Mfg. Corp., 1585 S. Lincoln Ave., Salem, O.
Steinen Mfg. Co., Wm., 43 Bruen St., Newark 5, N. J.
Stephens-Adamson Mfg. Co., 47 Ridgeway Ave., Aurora, Ill.
Sterlairco, Inc., 265 N. Elm St., Westfield, Mass.
Sterling, Inc., 5200 W Clinton Ave., Milwaukee 18, Wis.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22.
Sterling Engineering & Mfg. Corp., 114 Business St., Hyde Park 36, Mass.
Sterling Radiator Co., Inc., 260 N. Elm St., Westfield, Mass.
Stevens Mfg Co., Inc., P O. Box 1007, Mansfield, O.
Stewart-Hall Chemical Corp., 222 Washington St., Mt. Vernon, N. Y.
Stewart Ice Machine Co., 1282 W. 1st St., Pomona, Calif.
Stewart-Warner Corp., Heating & Air Conditioning Div., Lebanon, Ind.
Stewart-Warner Corp., South Wind Div., 1514 Drover St., Indianapolis.
Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.
Stic-Klip Mfg. Co., Inc., 112 Regent St., Cambridge 40, Mass.
Stiles Karlsonite Corp., 1550 Grand Ave., Waukegan, Ill.
Stockham Valves & Fittings, Box 2592, Birmingham 2, Ala.
Stoddard Industries, Inc., 3383 E. Layton Ave., Cudahy, Wis.
Stokes Molded Products, Div. of Electric Storage Battery Co., Taylor & Webster, Trenton 4, N. J.
Stout & Sons, David, 7016-7020 Manchester Blvd., St. Louis 17, Mo.
Stover Water Softener Co., 10 State Ave., St. Charles, Ill.
Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Strahman Valves, Inc., Nicolet Ave., Florham Park, N. J.
Straitsville Brick Co., P. O. Box 381, New Straitsville, O.
Stratford Pipe Scalloper Co., 1105 Ewing Ave., Clearwater, Fla.
Stromberg Time Corp., Thomaston, Conn.
Strong, Carlisle & Hammond, 508 Sandusky St., Conneaut, O.
Structa-Lung Co., The, 36407 Euclid Ave., Willoughby, O.
Structural Fibers, Inc., Fifth Ave., Chardon, O.
Struthers-Dunn, Inc., Lamb's Rd., Pitman, N. J.
Struthers Wells Corp., Warren, Pa.
Sturtevant Co., P. A., Addison, Ill.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., 1143 E. Jersey St., Elizabeth 4, N. J.
Sullivan Valve & Engineering Co., 923 Oregon Ave., Butte, Mont.
Summit Products Co., Uniontown, Pa.
Sumo Pumps, Inc., 23 Brown House Rd., Stamford, Conn.
Sundial Electric Co., 87-49 130th St., Richmond Hill 18, N. Y.
Sundstrand Hydraulics, 2210 Harrison Ave., Rockford, Ill.
Sun-Fire Stoker Corp., New Albany, Ind.
Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.
Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 35, N. Y.
Sunwarm, Inc., P. O. Box 266, Kingsport, Tenn.
Super Radiator Corp., 6714 Walker St., St. Louis Park, Minneapolis 26, Minn.
Super Slugger Co., 1020 Broadway, Bedford, O.
Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.
Superior Clay Corp., The, Uhrichsville, O.
Superior Combustion Industries, Inc., Times Tower, Times Sq., New York 36, N. Y.
Superior Pneumatic & Mfg. Co., Inc., 13800 Enterprise Ave., Cleveland 35, O.
Superior Valve and Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26, Pa.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Surface Chemicals, Inc., 1101 Thompson Ave., McKees Rocks, Pa.
Surface Combustion Corp., 2375 Dorr St., Toledo 1, O.
Sutorbilt Corp., Subsidiary of Fuller Co., 2966 E. Victoria St., Compton, Calif.
Sutton Corp., O. A., The, 1812 W. Second St., Wichita 2, Kan.
Sutton Mfg. Co., 112 W. Wilson Ave., Norfolk, Va.
Swaby Mfg Co., 3818 W. Armitage Ave., Chicago 47, Ill.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6, Mo.
Swan Engineering Co., 22-58 Nelson St., Bloomfield, N.J.
Swan Humidifier Co., 149 Bath St., Ballston Spa, N. Y.
Swan Mfg. Co., 1801 W. 26th St., Vancouver, Wash.
Swartwout Fabricators, Inc., 100 East North St., Kokomo, Ind.
Swepco Tube Corp., 1 Clifton Blvd., Clifton, N. J.
Swift & Co., Adhesive Products Dept., 4115 S. Packers Ave., Chicago 9, Ill.
Swift Lubricator Co., Inc., 19 James Bldg., Elmira, N. Y.
Swift Mfg. Co., Inc., 13595 Helen, Detroit 12, Mich.
Swiss Colony Engineering Co., 1301 8th St., Monroe, Wis.
Symmons Mfg. Co., 445 C St., Boston 10, Mass.
Synchronous Flame, Inc., Walworth, Wis.
Synchro-Start Products, Inc., 8151 N. Ridgeway Ave., Skokie, Ill.
Synchromatic Corp., Watertown, Wis.
Syntron Co., 161 Lexington Ave., Homer City, Pa.
Syrall Mfg. Co., 511 N. State St., Syracuse 3, N. Y.

T

Taber Pump Co., 272 Elm St., Buffalo 3, N. Y.
Taco Heaters, Inc., 1160 Cranston St., Cranston 9, R. I.
Taft-Jenkins Co., Inc., 27 Sargeant St., Holyoke, Mass.
Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y.
Talon Tools, Inc., North Arlington, N. J.
Tamms Industries Co., 228 N. LaSalle St., Chicago 1, Ill.
Tankit Co., The, 560 Belmont Ave., Newark, N. J.
Tapecoat Co., The, 1523 Lyons St., Evanston, Ill.
Taylor Engineering Corp., 6500 Epworth Blvd., Detroit 10, Mich.
Taylor Forge & Pipe Wks., P. O. Box 485, Chicago 90, Ill.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor Sons Co., The Charles, 710 Burns St., Cincinnati 14, O.
Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
Technical Filter Co., 2719 S. Poplar Ave., Chicago, Ill.
Technical Tape Corp., 240 N. Ave., New Rochelle, N. Y.
Technical Ply-Woods Sales, 6756 Crandon Ave., Chicago 49, Ill.
Techniflex Div., Port Jervis, N. Y.
Techno Corp., 16 W. 5th St., Erie, Pa.
Tecumseh Products Co., Tecumseh, Mich.
Tedco Cooling Towers, Div. of Engineering & Development Co., Inc., 2406 S. 7th Blvd., St. Louis, Mo.
Tedd Company, The, P. O. Box 1621, Rockford, Ill.
Tejax Engineering Corp., P. O. Box 348, Pawtucket, R. I.
Telechron Timers and Motors, Clock & Timer Dept., General Electric Co., Homer Ave., Ashland, Mass.
Teleflex Industrial Products, Inc., P. O. Box 151, Boyertown, Pa.
Telsco Fittings Div., 5422 Redfield St., Dallas, Tex.
Temco, Inc., 4101 Charlotte, Nashville, Tenn.
Tempo Products Co., 6515 Carnegie Ave., Cleveland 3, O.
Temprite Products Corp., Dept. HPAC, E. Maple Rd., Birmingham, Mich.
Temtrol, Inc., Okarche, Okla.
Tennessee Coal & Iron Div., United States Steel Corp., P. O. Box 599, Fairfield, Ala.
Tennessee Plastics, Inc., P. O. Box 786, Johnson City, Tenn.
Tennessee Products and Chemical Corp., 2611 West End Ave., Nashville 5, Tenn.
Tenney Engineering, Inc., 1090 Springfield Rd., Union, N. J.
Terre Haute Boiler Works Co., 1140 Crawford, Terre Haute, Ind.
Terry Steam Turbine Co., The, P. O. Box 1200, Hartford 1, Conn.
Tesco Inc., 1403 E. 5th Court, Tulsa, Okla.
Texaco, Inc., 135 E. 42nd St., New York 17, N. Y.
Texas Instruments, Inc., 3609 Buffalo Speedway, Houston 6, Tex.
Texas Instruments Inc., Metals & Controls Div., 34 Forest St., Attleboro, Mass.
Texas Metal Fabricating Co., P. O. Box 7567, Houston 7, Tex.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Texsteam Corp., P. O. Drawer 9127, Houston 11, Tex.
Therm Air Mfg. Co., Peekskill, N. Y.
Thermac Co., 14296 E. 6th St., Corona, Calif.
Thermador Electrical Mfg., 5119 District Blvd., Los Angeles 22.
Thermal Agency, 11 N. Jackson, Houston, Tex.
Thermal Engineering Corp., 2605 W. Dallas Ave., Houston 19, Tex.
Thermo-Base Div., Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind.

Therm-O-Disc, Inc., Mansfield, O.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thermoid Co., 200 Whitehead Road, Trenton, N. J.
Thermo King Corp., 314 W. 90th St., Minneapolis 20, Minn.
Thermo-Pak Boilers, Inc., 404 S. Palm Ave., Alhambra, Calif.
Thermo-Products, Inc., North Judson, Ind.
ThermoRay Corp., 26 Ave. B, Newark, N. J.
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., 10816 E. Fawcett Ave., El Monte, Calif.
Thermotank, Inc., Products Div., 11191 Lappin Ave., Detroit 34, Mich.
Therm-O-Wheel, Inc., 50th & Vernon Aves., Long Island City, N. Y.
Thern Machine Co.. 3760 W. Fourth St., Winona, Minn.
Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton, N. J.
Thomas Co., Arthur H., Vine Street at Third, Philadelphia 5, Pa.
Thomas Flexible Coupling Co., Main Ave. & Biddle St., Warren, Pa.
Thomas Industries, Inc., Electric Sprayit Div., 1415-25 Illinois Ave., Sheboygan. Wis.
Thompson and Co., 1085 Allegheny Ave., Oakmont, Pa.
Thompson & Son Co., The Henry G., 277 Chapel St., New Haven, Conn
Thompson Research & Mfg. Co., Davenport, Fla.
Thomson Electric Welder Co., 161 Pleasant St., Lynn, Mass.
Thor Power Tool Co., 175 N. State St., Aurora, Ill.
Thor Tool & Die Co., 865 Estabrook, San Leandro, Calif.
Thread-Ezy Mfg. Co., Corunna, Mich.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, 1821 Howard St., Evanston, Ill.
Thrush & Co., H. A., Peru, Ind.
Thwing-Albert Instrument Co., Penn and Pulaski Ave., Philadelphia 44, Pa.
Tierney Rotor Ventilator Co., 239 Fourth Ave., S., Minneapolis, Minn.
Timken Roller Bearing Co., The, 1835 Dueber Ave., S. W., Canton 6, O.
Tinnerman Corp., George A., 19920 Ingersoll Dr., Cleveland 16, O.
Tipptronics, Inc., Chagrin Falls, O.
Titeflex Inc.. Hendee St.. East Springfield, Mass.
Titus Mfg. Corp., Box 810, Hiway 20 West, Waterloo, Ia.
Titusville Iron Wks. Co., The, Titusville, Pa.
Tjernlund Mfg. Co., 2140 Kasota Ave., St. Paul 14, Minn.
Todd Shipyards Corp., Products Div., Columbia & Halleck Sts., Brooklyn 31, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4, O
Torit Mfg. Co., 1133 Rankin St., St. Paul 16, Minn.
Tork Time Controls, Inc., 33 Grove St., Mt. Vernon, N. Y.
Torrington Co., The, Bantam Bearings Div., South Bend 21, Ind.
Torrington Mfg Co.. The. Torrington, Conn.
TOT Towers Co., P. O. Box 18012, 5220 Lawndale, Houston 23, Tex.
Toungate & Coats, P. O. Box 9156 Allandale Station, Austin 17, Tex.
Tracerlab, Inc., 1601 Trapelo Rd., Waltham 54, Mass.
Trade-Wind Div., Robbins & Myers, Inc., 7755 Paramount Place, Pico Rivera, Calif.
Trageser Copper Works, Inc., New York International Airport, Jamaica 30, N. Y.
Trane Co., The, La Crosse, Wis.
Tranter Mfg Inc.. Lansing 4. Mich.
Trent, Inc., Leverington Ave. and Wilde St., Philadelphia 27, Pa.
Trent Tube Co., 498 S. Church St., East Troy, Wis.
Trerice Co H O.. 1420 W Lafayette Blvd. Detroit 16. Mich.
Triangle Conduit & Cable Co., Inc., Triangle & Jersey Aves., New Brunswick. N J.
Triangle Engineering Co. 1309 Ashland. Houston 8, Tex.
Triangle Mfg. Co., 724 Division St., Oshkosh, Wis.
Trico Fuse Mfg. Co.. 2948 N. 5th St.. Milwaukee 12. Wis.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., 50 Frank St., Worcester, Mass.
Trimount Instrument Co.. 3119 W. Lake St.. Chicago 12. Ill
Trindl Products, Ltd., 1807-11 S. Clark St., Chicago 16, Ill.
Trion, Inc., 1000 Island Ave., McKees Rocks, Pa.
Triplex Heating Specialty Co., Inc., 252 N. Grant, Peru, Ind.
Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
Tropical Paint Co., 1244-82 W. 70th St., Cleveland 2, O.
Tropical Tape Div 899 Country Club Circle Ft Lauderdale Fla
Truco Masonry Drilling Div., Wheel Trueing Tool Co., 3200 W. Davison, Detroit, Mich.
Truflo Fan Co., 523 Main St., Harmony, Pa.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Caniff and Trunk R R., Detroit 11, Mich.
Tru-Seal Div., Flick-Reedy Corp., 7N015 York Rd., Bensenville, Ill.
Tryco Products, Inc., Parcel Post Station Box No. 72, Westfield, Mass.
Tube Forgings of America, Inc., Foot S. W. Gibbs St., Portland 1, Ore.
Tube Manifold Corp., 415 Bryant St., North Tonawanda, N. Y.
Tube Turns Div. of Chemetron Corp., 224 E. Broadway, Louisville 1, Ky.
Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 11, Ky.
Tubenfin Coil Co., 220 Broadway, Houston 12, Tex.
Tubing Seal-Cap, Inc., 808 W. Santa Anita, San Gabriel, Calif.
Tubular Div., The National Supply Co., P. O. Box 416, Pittsburgh 30, Pa.
Tuck-Aire Furnace Co., 2045 Evans Ave., San Francisco 24, Calif.
Tufflite Plastics, Inc., 19 Low St., Ballston Spa, N. Y.
Tulsa Canvas Products Co., Inc., P. O. Box 2072, Tulsa, Okla.
Turb-O-Heat, Inc., 1133 East 35th St., Brooklyn 10, N. Y.
Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.
Turner Corp., 821-47 Park Ave., Sycamore, Ill.
Tuthill Pump Co., 939 E. 95th St., Chicago 19, Ill.
Tuttle & Bailey, Div. of Allied Thermal Corp., 215 Warren St., New Britain, Conn.
Tuttle Electric Products, Inc., Kirkland, Ill.
Tweco Products Inc., P. O. Box 666, Wichita 1, Kan.
Twin Disc Clutch Co., 1310 Preston, Rockford, Ill.
Typhoon Air Conditioning Co., Div. of Hupp Corp., 505 Carroll St., Brooklyn 15, N. Y.
Typhoon Heat Pump Co., Div. of Hupp Corp., 2001 Garcia Ave., P. O. Box 1123, Tampa, Fla.

U

[Also see "United States"]
U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54
U. S. Engineering & Mfg. Co., 3254 Lincoln Ave., Chicago 13, Ill.
U. S. Expansion Bolt Co., P. O. Box 827, State St. & P.R.R., York, Pa.
U S. Plug & Fitting Co., Wellington, O.
U-Con Co., P. O. Box 1607, Annapolis, Md.
Uehling Instrument Co., 473 Getty Ave., Paterson 3, N. J.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Uni-Crest Div., United Cork Companies, 1 Central Ave., Kearney, N. J
Unifilter Co., 43800 Grand River Ave., Novi, Mich.
Uniflow Mfg. Co., E. Lake Rd., Erie, Pa.
Uniflow Valve Corp., 19 Quine St., Cranford, N. J.
Unimax Switch Div., W. L. Maxson Corp., Ives Rd., Wallingford, Conn
Union Carbide Chemicals Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.
Union Carbide Plastics Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York, N. Y.
Union Chill Mat Co., Grant Bldg., Pittsburgh, Pa.
Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City, N. J.
Union Iron Wks., 1500 Cascade St., Erie, Pa.
Union Malleable Mfg. Co., Clark St., Ashland, O.
Union Metal Wks. Co., Inc., 128 Carter St., Chelsea 50, Mass.
Union Pump Co., 87 Capital Ave., S. W., Battle Creek, Mich.
Union Steel Chest Corp., LeRoy, N. Y.
Union Steel Corp., Union, N. J.
Unistrut Products Co., 933 W. Washington Blvd., Chicago 7, Ill.
United Centrifugal Pumps, 580 Second St., Oakland, Calif.
United Cork Companies, 1 Central Ave., Kearny, N. J.
United Electric Co., 501 Galveston, Wichita Falls, Tex.
United Electric Controls Co., 85 School St., Watertown, Mass.
United Instrument Co., 574 President St., Brooklyn 15, N. Y.
United Machinery Sales Co., 1741 W. 91st St., Chicago 20, Ill.
United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City 1, N. Y.
United Mineral & Chemical Corp., 16 Hudson St., New York 13, N. Y.
United Sensor & Control Corp., P. O. Box 127, Glastonbury, Conn.
United Sheet Metal Co., Inc., 540 S. Drexel Ave., Columbus 9, O.
United Specialties, Inc., P.O. Box 698, El Dorado, Ark.
[Also see "U. S."]
United States Air Conditioning Corp., P. O. Box 360, Delaware, O.
United States Electrical Tool Co., 3640 Llewellyn St., Cincinnati 23, O.
United States Gasket Co., 602 N. 10th St., Camden, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
United States Mineral Wool Co., Stanhope, N. J.
United States Pipe & Foundry Co., Birmingham, Ala.
United States Register Co., Burnham St.. Battle Creek. Mich.
United States Rubber Co., 1230 Ave. of the Americas, New York 20.
United States Steel Corp., 525 Wm. Penn Place Bldg., Pittsburgh 30, Pa.
United States Stoneware Co., 60 E. 42nd St., New York 17, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron 9, O
United Wire & Supply Corp., 1497 Elmwood Ave., Cranston, R. I.
Universal Controls Corp., P. O. Box 13122, Dallas 20, Tex.
Universal Diffuser Corp., 38 Marbledale Rd., Tuckahoe, N. Y
Universal Dynamics Corp., P. O. Box 9814, Arlington 9, Va.
Universal Electric Co., Owosso, Mich.
Universal Gear & Machine Co., 1301 E. McNichols Rd., Detroit 3, Mich.
Universal Instrument Co., 3807 Bunker Hill Rd., Brentwood, Md.
Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago, Ill.
Universal Sewer Pipe Corp., 1500 Union Commerce Bldg., Cleveland, O.
Universal Valve Co., P. O. Box 444, Elizabeth, N. J.
Universal Welder Corp., 3537 Lee Rd., Cleveland 20, O.
Uno Ventilator Co., 1236 Eastern Ave., Malden 48, Mass.
Up-Right Scaffolds, 1013 Pardee, Berkeley, Calif.
Urethane Foam Div., Rainbow Industries, Inc., Butler, Pa.
Utah Hydro Corp., 751 W. 8th So., Salt Lake City 4, Utah
Utica Products, Inc., Utica 4, N. Y.
Utica Radiator Corp., 2201 Dwyer Ave., Utica 2, N. Y.
Utility Fan Corp., Div. of Utility Appliance Corp., 911 E. 59th St., Los Angeles 1, Calif.

V

V. & E. Products, Inc., Schuylkill Haven, Pa.
V-Belt Clutch Co., 418 N. Western Ave., Los Angeles 4, Calif.
Vacu-Blast Co., Inc., P. O. Box 885, Belmont, Calif.
Vacuum-Electronic Engineering Co., 86 Denton Ave., New Hyde Park, L. I., N. Y.
Vacuum Gas Burner Co., Olean, N. Y.
Valco Corp., 1710 Roblyn Ave., St. Paul, Minn.
Valco, Inc., 1410 West St., Cincinnati 15, O.
Valcor Engineering Corp., Dept. 717, Carnegie Ave., Kenilworth, N. J.
Valdura Div., American-Marietta Co., 101 E. Ontario St., Chicago 11 Ill.
Valley Foundry & Machine Works, Inc., Fresno, Calif.

Valveblower Co. of Calif., 13729 E. Rosecrans Ave., Santa Fe Springs, Calif.
Valve Controls Co., 11120 Cumpston, North Hollywood, Calif.
Valves, Inc., F. G., 6450 W. River Parkway, Milwaukee, Wis.
Vanderman Mfg. Co., Mansfield Ave., Willimantic, Conn.
Van Noorden Co., E., 100 Magazine St., Boston 19, Mass.
Van-Packer Co., Div. of the Flintkote Co., 1232 McKinley Ave., Chicago Heights, Ill.
Vanton Pump & Equipment Corp., 201 Sweetland Ave., Hillside, N. J.
Vapor Heating Corp., 80 E. Jackson Blvd., Chicago 4, Ill.
Veco Products Co., 221 W. Glenside Ave., Glenside, Pa.
Vector Mfg. Co., Inc., Jenkintown, Pa.
Velan Valve Corp., Beekmantown Rd., Plattsburgh, N. Y.
Ventco, Inc., 1210 Tuam, P. O. Box 8036, Houston 4, Tex.
Ventfabrics, Inc., 640 N. Kedzie Ave., Chicago 12, Ill.
Ventil-Aire Corp., 1815 Decatur St., Ridgewood 27, N. Y.
Ventilouvre Co., Inc., The, Marietta, O.
Vernon Tool Co., Ltd., 1109 Meridian Ave., Alhambra, Calif.
Verson Allsteel Press Co., 9302 Kenwood Ave., Chicago 19, Ill.
Verson Mfg. Co., S. Lamar St. & Ledbetter Dr., Dallas, Tex.
Vibration Eliminator Co., 10-28 47th Ave., Long Island City 1, N. Y.
Vibration Mountings Inc., 98-25 50th Ave., Corona 68, N. Y.
Vic Mfg. Co., 1313 Hawthorne Ave., Minneapolis, Minn.
Victaulic Co. of America, P. O. Box 509, Elizabeth, N. J.
Victor Equipment Co., Welding Equipment Div., 844 Folsom St., San Francisco, Calif.
Victor Products Corp., 2633 Belmont Ave., Chicago 18, Ill.
Victory Engineering Corp., 118 Springfield Rd., Union, N. J.
Viking Air Products Div., National-U.S. Radiator Corp., 5601 Walworth Ave., Cleveland, O.
Viking Copper Tube Co., 16700 St. Clair Ave., Cleveland, O.
Viking Mfg. Corp., 1747 Chester Ave., Cleveland 14, O.
Viking Pump Co., Fourth and Rouse Sts., Cedar Falls 1, Ia.
Viking Research Corp., 618 Indiana Ave., Sheboygan, Wis.
Viking Shear Co., 1901 Raspberry St., Erie, Pa.
Vilter Mfg. Co., The, 2148 S. First St., Milwaukee 7, Wis.
Vimasco Corp., P. O. Box 465, Nitro, W. Va.
Virginia Smelting Co., West Norfolk, Va.
Vis-A-Plug, Inc., P. O. Box 100, King of Prussia, Pa.
Vogt Machine Co., Henry, 1000 W. Ormsby St., Louisville 10, Ky.
Vortox Company, 121 S. Alexander Ave., Claremont, Calif.
Voss Co., Inc., J. H. H., 785 E. 144th St., Corner of Wales Ave., New York 54, N. Y.
Voss Engineering, Inc., 5649 North Ravenswood Ave., Chicago 26, Ill.
Vulcan Electric Co., 88-90 Holten St., Danvers, Mass.
Vulcan Radiator Co., 775 Capitol Ave., Hartford 6, Conn.

W

W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
W-K-M, Div. of ACF Industries, Inc., P. O. Box 2117, Houston, Tex.
Waage Electric, Inc., 720 Colfax Ave., Kenilworth, N. J.
Wabash Corp., 2318 S. Western Ave., Chicago 8, Ill.
Wachs Co., E. H., The, 1525 N. Dayton St., Chicago 22, Ill.
Waco Steel Scaffolding, Inc., 630 N. Valley Mills Dr., Waco, Tex.
Wade Mfg. Co., Elgin, Ill.
Wadsworth Electric Mfg. Co., Inc., Covington, Ky.
Wagner Awning & Mfg. Co., 2658 Scranton Rd., Cleveland, O.
Wagner Bros., Inc., Equipment Div., 7800 Dix Rd., Detroit, Mich.
Wagner Electric Corp., 6370 Plymouth Ave., St. Louis 14, Mo.
Wakefield Co., The, Vermilion, O.
Waldron Corp., John, P. O. Box 791, New Brunswick, N. J.
Walker Jamar Co., 365 S. First Ave., E., Duluth, Minn.
Walker Mfg. & Sales Co., 1720 Penn St., St. Joseph, Mo.
Wall Tube and Metal Products Co., P. O. Box 330, Newport, Tenn.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Wallace Products Co., B. E., Exton 20, Pa.
Wallace Supplies Mfg. Co., 1304-12 Diversey Pkwy., Chicago 14, Ill
Wallace & Tiernan Incorporated, 25 Main St., Belleville 9, N. J.
Walsh-Hannon-Gladwin, Inc., 755 Boylston St., Boston 16, Mass.
Walton Co., Box 5, Elmwood Branch, Hartford 10, Conn.
Walton Laboratories, Inc., 1186 Grove St., Irvington 11, N. J.
Walworth Co., 750 Third Ave., New York 17, N. Y.
Wanson Corp., Charles and Juniata Sts., Lewiston, Pa.
Ward Foundries, Inc., J. P., Blossburg, Pa.
Ward Leonard Electric Co., 24 South St., Mt. Vernon, N. Y.
Ware Coupling & Nipple Co., Ware, Mass.
Warner Electric Brake & Clutch Co., Beloit, Wis
Warner Lewis Co., Div. of Fram Corp., 817 N. Lewis Pl., Tulsa, Okla.
Warner Ventilator Co., 225 Spring St., La Grange, Ind.
Warren Engineering Co., Broadway, N. J.
Warren Pumps, Inc., Warren, Mass.
Warren Refining & Chemical Co., The, 5151 Denison Ave., Cleveland 2, O.
Warren Register and Grille, Inc., 3680 N. W. 50th St., Miami, Fla.
Washington Steel Corp., Griffith Ave., Washington, Pa
Wassco Electric Products Corp., 2032 2nd Ave., So., St. Petersburg 12, Fla.
Water Cooling Corp., 71 Nassau St., New York 38, N. Y.
Water Cooling Equipment Co., 8601 New Hampshire, St. Louis 23, Mo.
Water Refining Co., 104 Manhattan St., Middletown, O.
Water Service Laboratories, Inc., 615 W. 131 St., New York 27.
Water Treatment Company of America, 1159 Hodgkiss St., Pittsburgh 12, Pa.
Water Tube Boiler & Tank Co., 4343 S. Oakly St., Chicago, Ill.
Waterloo Register Co., Inc., P. O. Box 72, Waterloo, Ia.
Waterman-Waterbury Co., The, 1121 Jackson St., N. E., Minneapolis 13, Minn.
Watervilet Tool Co., Inc., 1349 Broadway, Albany, N. Y.
Watkins Co., J. E., 307 Lake Street, Maywood, Ill.
Wa-Trol, 3232 Louisiana St., P. O. Box 6366, Houston, Tex.
Watsco, Inc., 1020 E. 15th St., Hialeah, Fla.
Watson & McDaniel Co., 440 N. Marshall, Philadelphia 23, Pa.
Watson-Standard Co., 225 Galveston Ave., Pittsburgh 30, Pa.
Watts Regulator Co., 10 Embankment St., Lawrence, Mass.
Waukesha Foundry Co., Waukesha, Wis.
Waukesha Motor Co., Waukesha, Wis.
Waverly Heating Supply Co., 117 Elliott St., Beverly, Mass.
Way-Wolff Associates, Inc., 45-10 Vernon Blvd., Long Island City 1.
Wayne Coil & Tower Corp., Rt. 23, Pompton Plains, N. J.
Wayne Home Equipment Co., Inc., 801 Glasgow Ave., Ft. Wayne 4, Ind.
Wayne Pump Co., The, Div. of Symington Wayne Corp., Ft. Wayne 4, Ind.
Weatherall Engineers, Inc., 478 Smithfield Ave., Providence, R. I.
Weatherbuster Corp., 991 Sharp Ave., N. W., Camden, Ark.
Weatherhead Co., The, Ft. Wayne Div., 128 W. Washington Blvd., Ft. Wayne, Ind.
Weather King of Florida, Inc., 2310 Coolidge Ave., Orlando, Fla.
Webb Corp., The, Webb City, Mo.
Webster & Co., Warren, 1664 Federal St., Camden 5, N. J.
Webster Electric Co., Clark & DeKoven Aves., Racine, Wis.
Webster Engineering Co., P. O. Box 5246, Tulsa 16, Okla.
Wedgeplug Valve Co., Div. of Stockham Valves & Fittings, Box 2592, Birmingham 2, Ala.
Wedge Protectors, Inc., 3985 Jennings Rd., Cleveland 9, O.
Weighing & Control Components, Inc., Industrial Park, E. County Line Rd., Hatboro, Pa.
Weil-McLain Co., Michigan City, Ind.
Weil Pump Co., 1523 N. Fremont St., Chicago 22, Ill.
Weinman Pump Mfg. Co., The, 290 W. Spruce St., Columbus 8, O.
Weirton Steel Co., Weirton, W. Va.
Weiss & Son, Inc., Albert A., 261 Vanderbilt Ave., Brooklyn 5, N. Y.
Weksler Instruments Corp., 195 E. Merrick Rd., Freeport, Long Island, N. Y.
Weldex, Inc., 18425 Weaver, Detroit, Mich.
Welding Apparatus Co., 2750 W. Van Buren St., Chicago 12, Ill.
Weldit, Inc., 990 Oakman Blvd., Detroit 38, Mich.
Welsbach Corp., The, Kitson Valve Div., 1500 Walnut St., Philadelphia 2, Pa
Wen Products, Inc., 5808 Northwest Highway, Chicago 31, Ill.
Wendt Co., O. A., 1655 W. Fullerton Ave., Chicago 14, Ill.
Wer-Coy Fabrication Co., 2232 Beniteau St., Detroit 14, Mich.
Wesche Electric Co., B. A., 9027 Shell Rd., Cincinnati 42, O.
Wescott Snyder Mfg. Corp., Madison, N. J.
Wesix Electric Heater Co., 390-1st St., San Francisco 5, Calif.
West Instrument Corp., 4363 W. Montrose Ave., Chicago 41, Ill.
Western Blower Co., 1800 Airport Way, Seattle 4, Wash.
Western Boiler Co., 1600 N. Indiana St., Los Angeles 63, Calif.
Western Engineering & Mfg. Co., P. O. Box 66455, Los Angeles 66.
Western Felt Works, 4029-4117 Ogden Ave., Chicago 23, Ill.
Western Plastics Corp., 3110 Ruston Way, Tacoma, Wash.
Western Piping & Engineering Co., Inc., 123 Kansas St., San Francisco 3.
Western Precipitation Corp., 1000 W. 9th St., Los Angeles 54, Calif.
Western Wire & Iron Works, Inc., 957 W. 18th Pl., Chicago 8, Ill.
Western Wire Products Co., 1415-35 S. 18th St., St. Louis 4, Mo.
Westinghouse Air Brake Co., Industrial Products Div., Box 36, Wilmerding, Pa.
Westinghouse Electric Corp., 4454 Genesee St., Buffalo 5, N. Y.
Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Westinghouse Electric Corp., Electric Appliance Divisions, 300 Phillipi Rd., Columbus 16, O.
Westinghouse Electric Corp., Electric Heater Div., 5815 Peladeau St., Emeryville 8, Calif.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Westinghouse Electric Corp., Sturtevant Div., Damon St., Hyde Park, Boston 36, Mass.
Westline Products Div., Western Lithograph Co., 600 E. 2nd St., Los Angeles 54, Calif.
Westronics, Inc., 3605 McCart St., Fort Worth, Tex.
Wheatland Tube Co., Bankers Securities Bldg., Juniper & Walnut Sts., Philadelphia 7, Pa.
Wheelabrator Corp., 1401 S. Byrkit St., Mishawaka, Ind.
Wheeler Mfg. Co., The, 80 Ross St., Ashtabula, O.
Wheeler Mfg. Co., C. H., 19th & Lehigh, Philadelphia 32, Pa.
Wheeler Mfg. Co., C. H., Economy Pump Div., 19th & Lehigh, Philadelphia 32, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling Steel Corp. Bldg., Wheeling, W. Va.
Wheelock Signals, Inc., Long Branch, N. J.
Whiddett Co., John C., 3850 Garrett Rd., Drexel Hill, Pa.
Whirlpool Corp., St. Joseph, Mich.
Whirlwind Mfg. Co., 3520 Clinton, Houston, Tex.
White Flomatic Div., Flomatic Corp., P. O. Box 267, Hoosick Falls, N. Y.
White-Rodgers Co., 1209 Cass Ave., St. Louis 6, Mo.
Whitehall Engineering Co., Inc., 1630 S. Michigan, Chicago, Ill.
Whitewater Pump Co., Inc., Kidd St., Whitewater, Wis.
Whiting Corp., Harvey, Ill.
Whiting Fire Power Products Corp., 1101 John Ave., Superior, Wis
Whitlam Mfg. Co., J. C., Wadsworth, O.
Whitlock Mfg. Co., 44 South St., West Hartford 10, Conn.
Whitney Chain Co., 237 Hamilton St., Hartford 2, Conn.
Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.

Whitney Metal Tool Co., 110 Forbes St., Rockford, Ill.
Whiton Machine Co., 190 Howard, New London, Conn.
Whittaker Controls, A Div. of Telecomputing Corp., 915 N. Citrus Ave., Los Angeles 38, Calif.
Whittington Pump & Engineering Corp., 1126 Prospect, Indianapolis 3, Ind.
Whitty Co., Inc., 86 Western Ave., Boston 34, Mass.
Wickes Boiler Co., The, 515 N. Washington, Saginaw, Mich.
Wickford Products, Inc., 449 Broadway, New York, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 575 Madison Ave., New York 22, N. Y.
Wiedeke Co., The Gustav, 1833 Richard St., Dayton 1, O.
Wiedemann Machine Co., Gulph Rd., King of Prussia, Pa.
Wiegand Co., Edwin L., 7610 Thomas Blvd., Pittsburgh 8, Pa.
Wiggins Oil Tool Co., Inc., E. B., 3424 E. Olympic Blvd., Los Angeles 23, Calif.
Wilbur & Williams Co., 650 Pleasant St., Norwood, Mass.
Wilcolator Co., 1001 Newark Ave., Elizabeth 8, N. J.
Wilhelm Co., A., 3rd and Bern Sts., Reading, Pa.
Wilkins Regulator Co., 2031 E. 27th St., Los Angeles, Calif.
Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena 3, Calif.
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Williamson Adhesives, Inc., 8220 Kimball Ave., Skokie, Ill.
Williamson, Inc., T. D., P. O. Box 40, Tulsa 2, Okla.
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Wilmington Plastics Co., 810 S. Heald St., P. O. Box 365, Wilmington, Del.
Wilson Div., H. A., Engelhard Industries, 2655 Route 22, Union, N. J.
Wilson Co., K. R., General Offices & Factories, Arcade, N. Y.
Wilson Electric Furnace Co., Rossville, Ga.
Wilson Engineering Corp., 6 N. Michigan Ave., Chicago 2, Ill.
Wilson, Inc., Thomas C., 21-11 44th Ave., Long Island City, N. Y.
Wilson Industries, Inc., 3831 Bedford Ave., Brooklyn 29, N. Y.
Wilson Manufacturing Co., 787 S. Barksdale St., Memphis 4, Tenn.
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Windmaster Div., Lima Register Co., 1790 N. Cable Rd., Lima, O.
Wind-Way Fan & Ventilator Co., 527 St. Joseph St., New Orleans 12.
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co. Inc., 140 Vreeland Mills Rd., Linden, N. J.
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Worner Electronic Devices, Rankin, Ill.
Worthington Corp., Ampere Station, East Orange, N. J.
Wright-Austin Co., 3245 Wright St., Detroit 7, Mich.
Wright Mfg. Co., 2902 W. Thomas Rd., Phoenix, Ariz.
Wyandotte Chemicals Corp., Wyandotte, Mich.
Wysong & Miles Co., 625 Fulton St., Greensboro, N. C.

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Yeomans Bros. Co., 2000-5 N. Ruby St., Melrose Park, Ill.
York Corp., Subsidiary of Borg-Warner Corp., Roosevelt Ave., York, Pa.
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Zink Co., John, 4401 S. Peoria, Tulsa 5, Okla.
Zippertubing Co., 752 S. San Pedro St., Los Angeles, Calif.
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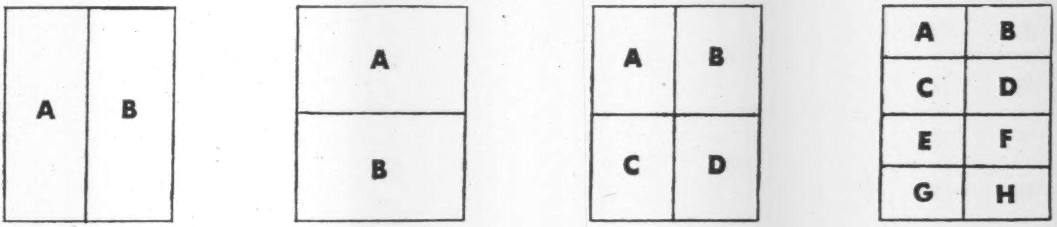

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HEATING, PIPING & AIR CONDITIONING, CHICAGO, ILL. **DATE** ____________

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Chicago, Illinois

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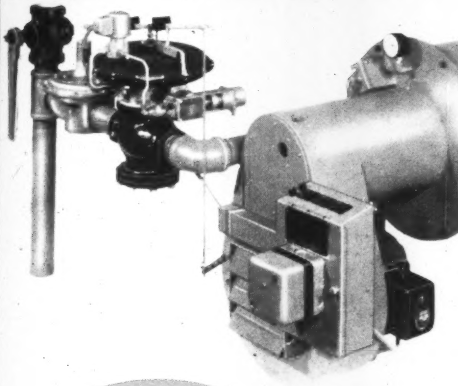
CHICAGO 2, ILLINOIS

Gordon-Piatt

PLANNED *PERFORMANCE** BURNERS

A Complete Line of Combustion Equipment

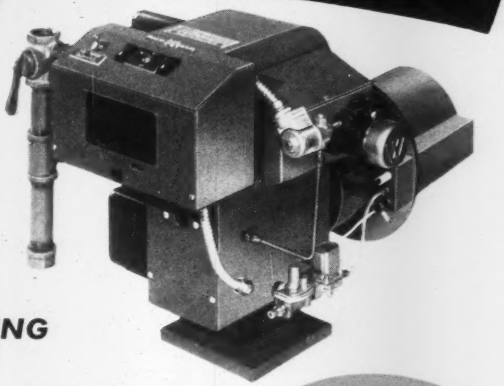
FORCED DRAFT



MODEL FGR
Capacities
1 to 9 million
BTU/HR

TURBO-RING

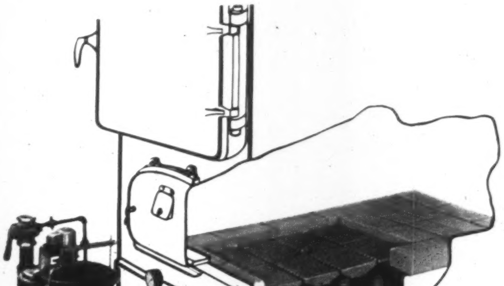
Gas, oil, or combination burner. No stack required on boilers equipped for pressure firing.



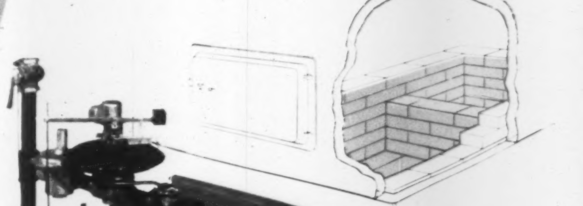
MODEL R
Capacities
up to 2¼ million
BTU/HR

ATMOSPHERIC

BLUE LINE Flame upshot burner, natural or L-P gas. Capacities up to 8 million BTU/hr.



TYPE H inshot burner for horizontal flame applications — natural or L-P gas. Capacities up to 15 million BTU/hr.



***PLANNED — Factory assembled, pre-wired for "Bolt-on" installation.**

***PERFORMANCE — Custom matched to individual boilers for quiet, efficient operation.**

Gordon & Piatt also manufacture a complete line of domestic conversion burners plus large dual-fuel units. Write for literature and complete information.

Gordon & Piatt, Inc.

P. O. BOX
914

WINFIELD, KANSAS

JOHNSON R-317 AIR FLOW CONTROLLER

FOR HIGH-VELOCITY DUAL-DUCT SYSTEMS

- Provides positive, constant volume air discharge through high-velocity mixing units. Assures constant volume regardless of number of units in the system, length of duct runs, or pressure differences between hot and cold ducts.
- Eliminates costly manual balancing.
- Eliminates variation in sound levels.
- Operates at any pressure difference from .05″ to 1″ W.G. Adjustable set point. Produces 3 psi air pressure change per .01″ W.G. pressure change.
- Allows static pressure of the air distribution system to be maintained at the minimum required for proper air distribution — *does not require a higher pressure for instrument operation.* This is an important economic factor in initial fan cost, fan horsepower consumption, and duct design.
- Powered by the control air supply system — no problems due to residual dirt in ducts or dirt-contaminated duct air.
- Designed for use with leading makes of mixing boxes.

For more information write for Bulletin R-317. Johnson Service Company, Milwaukee 1, Wisconsin.

JOHNSON SERVICE CO
R-317
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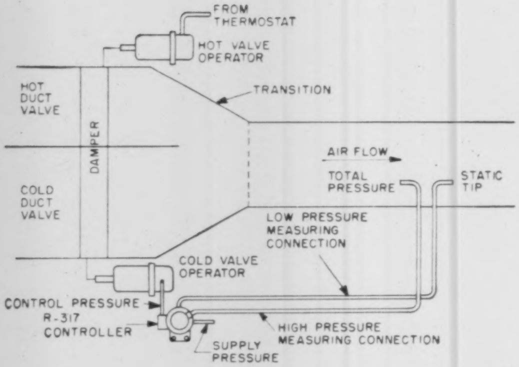
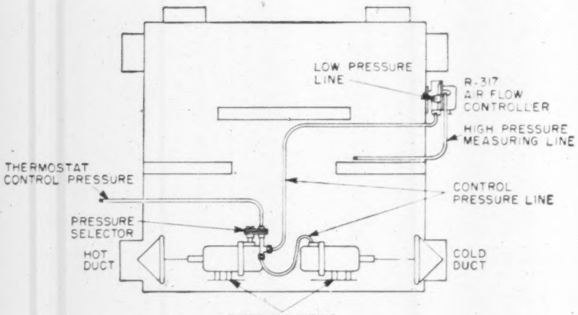
R-317 Air Flow Controller


FROM THERMOSTAT
HOT VALVE OPERATOR
HOT DUCT VALVE
TRANSITION
DAMPER
AIR FLOW
TOTAL PRESSURE
STATIC TIP
COLD DUCT VALVE
LOW PRESSURE MEASURING CONNECTION
COLD VALVE OPERATOR
CONTROL PRESSURE
R-317 CONTROLLER
HIGH PRESSURE MEASURING CONNECTION
SUPPLY PRESSURE

Typical Application to Large Volume Unit


LOW PRESSURE LINE
R-317 AIR FLOW CONTROLLER
HIGH PRESSURE MEASURING LINE
THERMOSTAT CONTROL PRESSURE
CONTROL PRESSURE LINE
PRESSURE SELECTOR
HOT DUCT
COLD DUCT
FIXED MOUNTING PLATES

R-317 Applied to Ceiling Unit

JOHNSON CONTROL

PNEUMATIC SYSTEMS

DESIGN • MANUFACTURE • INSTALLATION • SINCE 1885